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FCC TEST REPORT (15.247)

REPORT NO.: RF110916C18

MODEL NO.: BelAir20E-10 (Refer to item 3.1 for the more details)

FCC ID: RAR40002001

RECEIVED: Sep. 16, 2011

TESTED: Oct. 05 ~ Oct. 07, 2011

ISSUED: Oct. 11, 2011

APPLICANT: BelAir Networks Inc.

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ISSUED BY: Bureau Veritas Consumer Products Services (H.K.)
Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New
Taipei City, Taiwan (R.O.C)

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei
Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	N/A	Oct. 11, 2011



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1. CERTIFICATION

PRODUCT: 802.11n WIFI router

MODEL NO.: BelAir20E-10 (Refer to item 3.1 for the more details)

BRAND: BelAir (Refer to item 3.1 for the more details)

APPLICANT: BelAir Networks Inc.

TEST SAMPLE: ENGINEERING SAMPLE

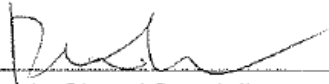
TESTED: Oct. 05 ~ Oct. 07, 2011


STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**

ANSI C63.4-2003

ANSI C63.10-2009

The above equipment (Model: BelAir20E-10) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY :  , DATE : Oct. 11, 2011
Pettie Chen / Specialist

APPROVED BY :  , DATE : Oct. 11, 2011
Gary Chang / Technical Manager



2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -7.67dB at 0.150MHz.
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2483.50MHz.
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 30dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	802.11n WIFI router
MODEL NO.	BelAir20E-10 (Refer to NOTE for the more details)
FCC ID	RAR40002001
NOMINAL VOLTAGE	48Vdc (Adapter) 55Vdc (POE)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300.0Mbps
OPERATING FREQUENCY	2412.0 ~ 2462.0MHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
OUTPUT POWER	986.1mW
ANTENNA TYPE	PIFA antenna with 3dBi gain
ANTENNA CONNECTER	NA
DATA CABLE	NA
I/O PORTS	RJ45, USB
ACCESSORY DEVICES	Adapter

NOTE:

1. The following models are provided to this EUT.

BRAND	MODEL	DESCRIPTION
BelAir	BelAir20E-10	All models are electrically identical, different brand names, model names are for marketing purpose.
MOTOROLA	CW20E-10	

2. The EUT provides two completed transmitters and two receivers.

MODULATION MODE	TX FUNCTION
802.11b	2TX
802.11g	2TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX



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3. The EUT was powered by the following adapter and POE:

ADAPTER	
BRAND:	LEADER ELECTRONICS INC
MODEL:	MU24-B480050-A1
INPUT:	100-240Vac, 50/60Hz, 1.0A
OUTPUT:	48Vdc, 0.5A
POWER LINE:	1.5 m non-shielded cable without core

POE	
MODEL:	PD-7001G
INPUT:	100-240Vac, 50-60Hz, 0.8A
OUTPUT:	55Vdc, 0.570A

**POE as above is provided as support unit only.

4. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 DESCRIPTION OF TEST MODES

11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2422MHz	5	2442MHz
2	2427MHz	6	2447MHz
3	2432MHz	7	2452MHz
4	2437MHz		

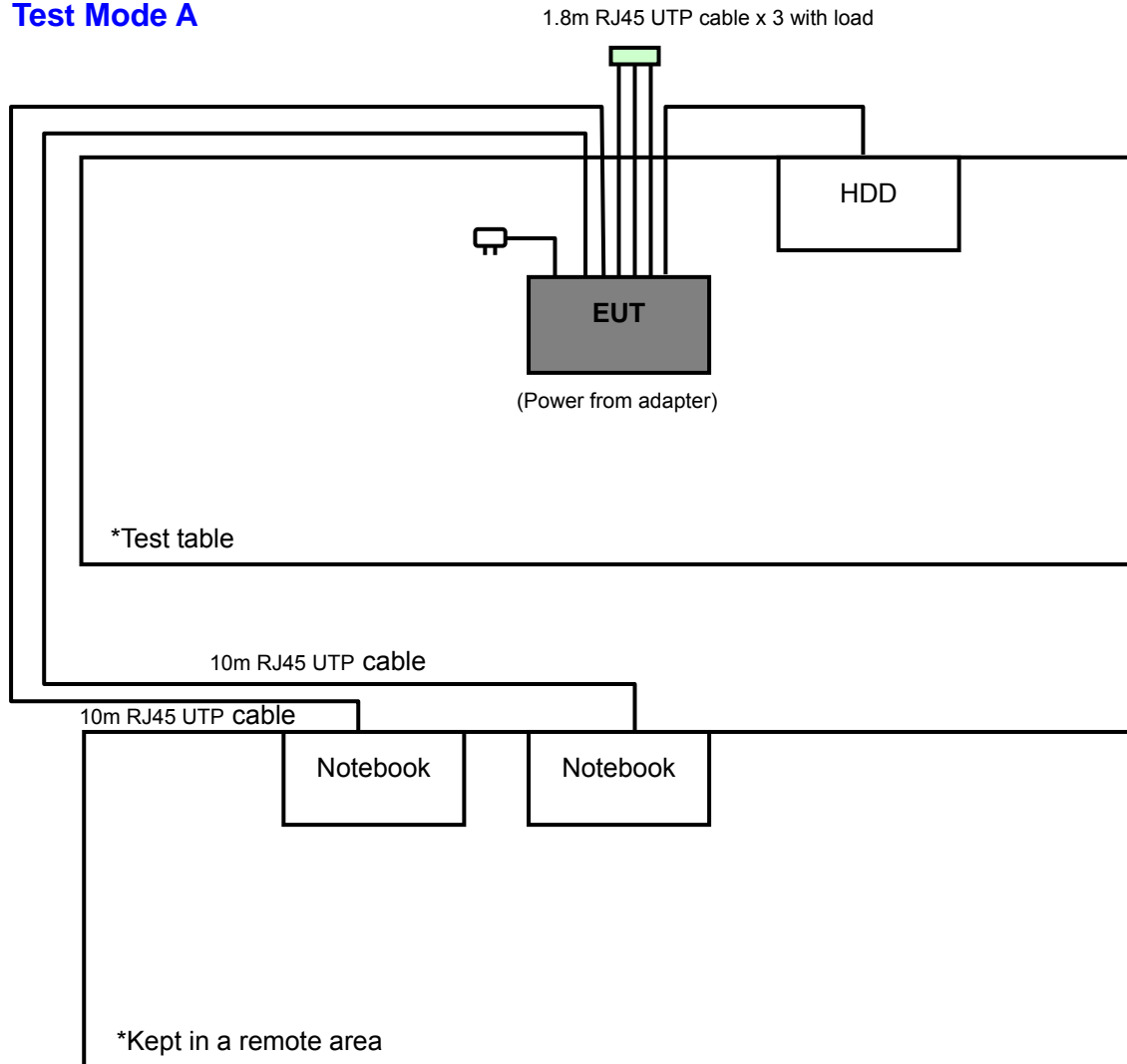
3.3 POWER SETTING

802.11b			802.11g		
CHANNEL	FREQUENCY	POWER SETTING	CHANNEL	FREQUENCY	POWER SETTING
1	2412MHz	27	1	2412MHz	19
6	2437MHz	25	6	2437MHz	18
11	2462MHz	25	11	2462MHz	20

802.11n (20MHz)			802.11n (40MHz)		
CHANNEL	FREQUENCY	POWER SETTING	CHANNEL	FREQUENCY	POWER SETTING
1	2412MHz	19	1	2422MHz	18
6	2437MHz	18	4	2437MHz	19
11	2462MHz	20	7	2452MHz	18

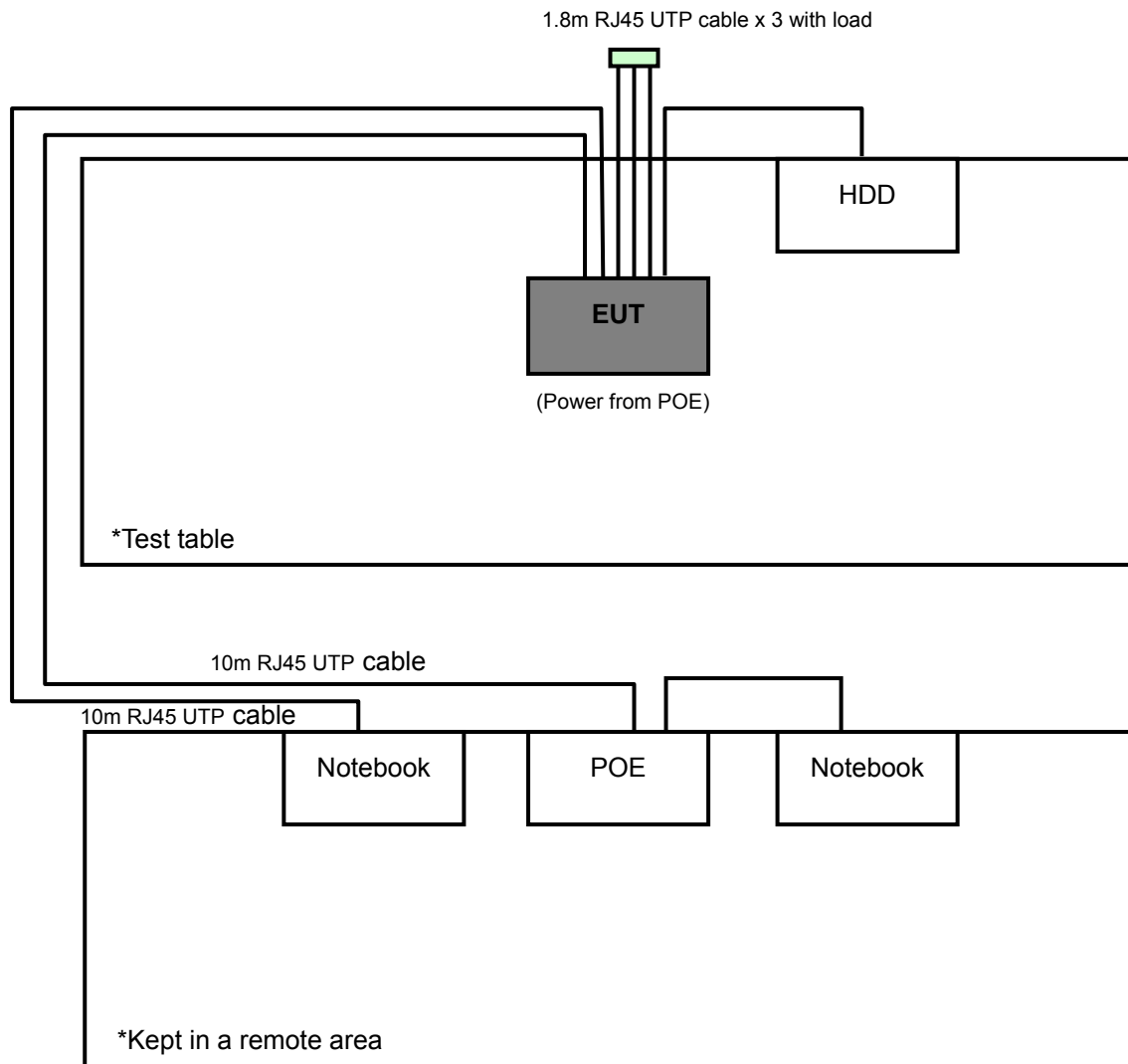
3.3.1 CONFIGURATION OF SYSTEM UNDER TEST

Test Mode A





Test Mode B





3.3.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter
B	-	√	√	-	Power from POE

Where **RE≥1G**: Radiated Emission above 1GHz **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

NOTE: "-" means no effect.

RADIATED EMISSION TEST (ABOVE 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
A	802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	15.0

RADIATED EMISSION TEST (BELOW 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11g	1 to 11	11	OFDM	BPSK	6.0

POWER LINE CONDUCTED EMISSION TEST:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11g	1 to 11	11	OFDM	BPSK	6.0



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BANDEDGE MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	7.2
A	802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	15.0

ANTENNA PORT CONDUCTED MEASUREMENT:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
A	802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Anderson Hong
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Anderson Hong
PLC	23deg. C, 66%RH	120Vac, 60Hz	Whisky Chang
APCM	25deg. C, 65%RH	120Vac, 60Hz	Anderson Hong



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3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

ANSI C63.4-2003

ANSI C63.10-2009

All test items have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	External Hard Disk	Terasys	F12-UF	A0100222-4A60004	FCC DoC Approved
2	Notebook	DELL	D531	CN-0XM006-48643-81U-2610	QDS-BRCM1020
3	Notebook	DELL	D820	21498926752	FCC DoC Approved
4	POE	NA	PD-7001G	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.5 m shielded cable, terminated with USB connector, w/o core.
2	10m RJ45 UTP cable.
3	10m RJ45 UTP cable. (For test mode A) 3.0m RJ45 UTP cable. (For test mode B)
4	10m RJ45 UTP cable.

NOTE:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 2~4 acted communication partners to transfer data.
3. Item 4 was provided by client.



4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a). Other emissions shall be at least 20dB below the highest level of the desired power.

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



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4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100744	Apr. 19, 2011	Apr. 18, 2012
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jan. 06, 2011	Jan. 05, 2012
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Apr. 12, 2011	Apr. 11, 2012
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-563	Sep. 06, 2011	Sep. 05, 2012
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 27, 2010	Dec. 26, 2011
Preamplifier Agilent	8449B	3008A01911	Nov. 03, 2010	Nov. 02, 2011
Preamplifier Agilent	8447D	2944A10638	Nov. 03, 2010	Nov. 02, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295013/4 283403/4	Aug. 19, 2011	Aug. 18, 2012
RF signal cable Worken	8D-FB	Cable-HYCH9-01	Aug. 13, 2011	Aug. 12, 2012
Software	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn Table Controller EMCO	2090	NA	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 9.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 460141.
 5. The IC Site Registration No. is IC 7450F-4.



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4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

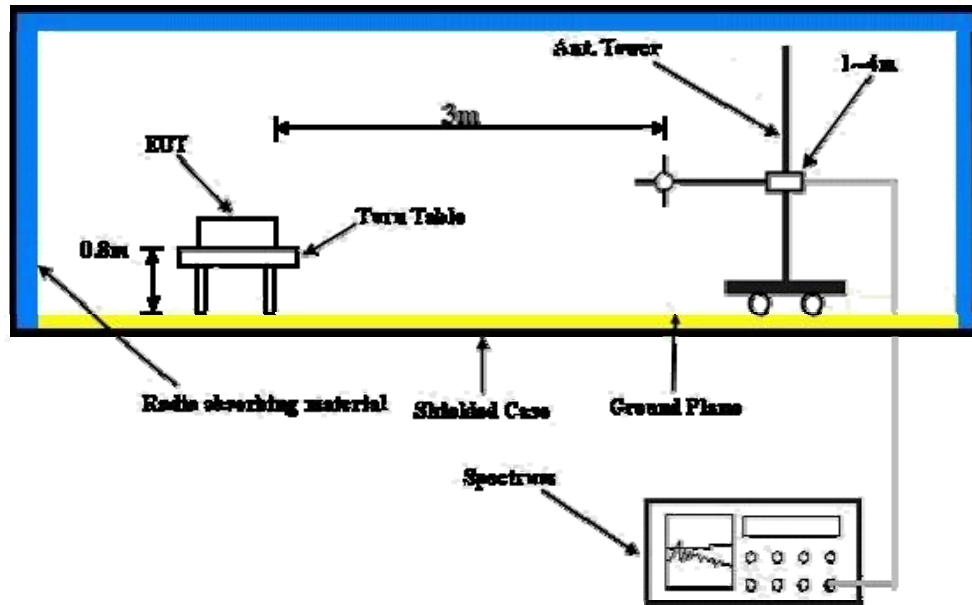
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on the testing table.
- b. Prepared notebooks to act as communication partners and placed them outside of testing area.
- c. The communication partners connected with EUT via a RJ45 cable and run a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- d. The communication partner sent data to EUT by command "PING".
- e. The communication partner read and wrote with the HDD via EUT.



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4.1.7 TEST RESULTS

ABOVE 1GHz WORST-CASE DATA : 802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2388.00	70.2 PK	74.0	-3.8	1.20 H	112	38.70	31.50
2	2388.00	51.4 AV	54.0	-2.6	1.20 H	112	19.90	31.50
3	*2412.00	113.8 PK			1.20 H	112	82.20	31.60
4	*2412.00	109.7 AV			1.20 H	112	78.10	31.60
5	4824.00	53.2 PK	74.0	-20.8	1.06 H	232	15.50	37.70
6	4824.00	50.1 AV	54.0	-3.9	1.06 H	232	12.40	37.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2388.00	66.3 PK	74.0	-7.7	1.51 V	232	34.80	31.50
2	2388.00	49.3 AV	54.0	-4.7	1.51 V	232	17.80	31.50
3	*2412.00	109.7 PK			1.18 V	254	78.10	31.60
4	*2412.00	105.7 AV			1.18 V	254	74.10	31.60
5	4824.00	55.4 PK	74.0	-18.6	1.15 V	224	17.70	37.70
6	4824.00	52.5 AV	54.0	-1.5	1.15 V	224	14.80	37.70

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	112.5 PK			1.17 H	112	80.80	31.70
2	*2437.00	108.3 AV			1.17 H	112	76.60	31.70
3	4874.00	50.6 PK	74.0	-23.4	1.47 H	295	12.80	37.80
4	4874.00	46.4 AV	54.0	-7.6	1.47 H	295	8.60	37.80
5	7311.00	51.0 PK	74.0	-23.0	1.00 H	223	7.10	43.90
6	7311.00	39.8 AV	54.0	-14.2	1.00 H	223	-4.10	43.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	108.5 PK			1.42 V	246	76.80	31.70
2	*2437.00	104.5 AV			1.42 V	246	72.80	31.70
3	4874.00	54.5 PK	74.0	-19.5	1.13 V	227	16.70	37.80
4	4874.00	52.5 AV	54.0	-1.5	1.13 V	227	14.70	37.80
5	7311.00	54.4 PK	74.0	-19.6	1.03 V	357	10.50	43.90
6	7311.00	47.3 AV	54.0	-6.7	1.03 V	357	3.40	43.90

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.2 PK			1.17 H	114	80.40	31.80
2	*2462.00	108.0 AV			1.17 H	114	76.20	31.80
3	2483.50	68.9 PK	74.0	-5.1	1.17 H	112	37.00	31.90
4	2483.50	50.6 AV	54.0	-3.4	1.17 H	112	18.70	31.90
5	4924.00	53.2 PK	74.0	-20.8	1.14 H	298	15.30	37.90
6	4924.00	49.0 AV	54.0	-5.0	1.14 H	298	11.10	37.90
7	7386.00	53.6 PK	74.0	-20.4	1.00 H	58	9.50	44.10
8	7386.00	42.9 AV	54.0	-11.1	1.00 H	58	-1.20	44.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.2 PK			1.40 V	247	76.40	31.80
2	*2462.00	104.1 AV			1.40 V	247	72.30	31.80
3	2483.50	66.1 PK	74.0	-7.9	1.34 V	249	34.20	31.90
4	2483.50	48.4 AV	54.0	-5.6	1.34 V	249	16.50	31.90
5	4924.00	54.8 PK	74.0	-19.2	1.67 V	253	16.90	37.90
6	4924.00	52.6 AV	54.0	-1.4	1.67 V	253	14.70	37.90
7	7386.00	53.4 PK	74.0	-20.6	1.08 V	137	9.30	44.10
8	7386.00	45.2 AV	54.0	-8.8	1.08 V	137	1.10	44.10

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.



A D T

802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.7 PK	74.0	-2.3	1.22 H	108	40.20	31.50
2	2390.00	50.2 AV	54.0	-3.8	1.22 H	108	18.70	31.50
3	*2412.00	108.7 PK			1.22 H	107	77.10	31.60
4	*2412.00	97.6 AV			1.22 H	107	66.00	31.60
5	4824.00	53.7 PK	74.0	-20.3	1.28 H	225	16.00	37.70
6	4824.00	34.5 AV	54.0	-19.5	1.28 H	225	-3.20	37.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.9 PK	74.0	-5.1	1.26 V	250	37.40	31.50
2	2390.00	48.0 AV	54.0	-6.0	1.26 V	250	16.50	31.50
3	*2412.00	107.2 PK			1.26 V	250	75.60	31.60
4	*2412.00	96.0 AV			1.26 V	250	64.40	31.60
5	4824.00	51.5 PK	74.0	-22.5	1.25 V	228	13.80	37.70
6	4824.00	35.8 AV	54.0	-18.2	1.25 V	228	-1.90	37.70

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * ”: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.7 PK	74.0	-8.3	1.20 H	108	34.20	31.50
2	2390.00	50.6 AV	54.0	-3.4	1.20 H	108	19.10	31.50
3	*2437.00	108.2 PK			1.20 H	108	76.50	31.70
4	*2437.00	97.1 AV			1.20 H	108	65.40	31.70
5	2483.50	67.8 PK	74.0	-6.2	1.15 H	112	35.90	31.90
6	2483.50	50.5 AV	54.0	-3.5	1.15 H	112	18.60	31.90
7	4874.00	52.7 PK	74.0	-21.3	1.02 H	224	14.90	37.80
8	4874.00	40.3 AV	54.0	-13.7	1.02 H	224	2.50	37.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.1 PK	74.0	-11.9	1.01 V	253	30.60	31.50
2	2390.00	47.4 AV	54.0	-6.6	1.01 V	253	15.90	31.50
3	*2437.00	106.8 PK			1.01 V	253	75.10	31.70
4	*2437.00	95.5 AV			1.01 V	253	63.80	31.70
5	2483.50	62.8 PK	74.0	-11.2	1.01 V	257	30.90	31.90
6	2483.50	47.5 AV	54.0	-6.5	1.01 V	257	15.60	31.90
7	4874.00	60.5 PK	74.0	-13.5	1.48 V	260	22.70	37.80
8	4874.00	45.5 AV	54.0	-8.5	1.48 V	260	7.70	37.80

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	110.5 PK			1.14 H	109	78.70	31.80
2	*2462.00	99.4 AV			1.14 H	109	67.60	31.80
3	2483.50	72.8 PK	74.0	-1.2	1.14 H	109	40.90	31.90
4	2483.50	52.0 AV	54.0	-2.0	1.14 H	109	20.10	31.90
5	4924.00	43.9 PK	74.0	-30.1	1.22 H	208	6.00	37.90
6	4924.00	32.7 AV	54.0	-21.3	1.22 H	208	-5.20	37.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.2 PK			1.12 V	251	77.40	31.80
2	*2462.00	97.8 AV			1.12 V	251	66.00	31.80
3	2483.50	66.3 PK	74.0	-7.7	1.12 V	250	34.40	31.90
4	2483.50	48.5 AV	54.0	-5.5	1.12 V	250	16.60	31.90
5	4924.00	51.0 PK	74.0	-23.0	1.09 V	252	13.10	37.90
6	4924.00	37.0 AV	54.0	-17.0	1.09 V	252	-0.90	37.90

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.



A D T

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.5 PK	74.0	-2.5	1.19 H	128	40.00	31.50
2	2390.00	50.6 AV	54.0	-3.4	1.19 H	128	19.10	31.50
3	*2412.00	108.3 PK			1.19 H	128	76.70	31.60
4	*2412.00	97.1 AV			1.19 H	128	65.50	31.60
5	4824.00	48.3 PK	74.0	-25.7	1.28 H	234	10.60	37.70
6	4824.00	33.0 AV	54.0	-21.0	1.28 H	234	-4.70	37.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.0 PK	74.0	-6.0	1.19 V	253	36.50	31.50
2	2390.00	47.6 AV	54.0	-6.4	1.19 V	253	16.10	31.50
3	*2412.00	106.7 PK			1.19 V	253	75.10	31.60
4	*2412.00	95.4 AV			1.19 V	253	63.80	31.60
5	4824.00	50.4 PK	74.0	-23.6	1.28 V	234	12.70	37.70
6	4824.00	34.7 AV	54.0	-19.3	1.28 V	234	-3.00	37.70

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * ”: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.5 PK	74.0	-6.5	1.19 H	128	36.00	31.50
2	2390.00	50.6 AV	54.0	-3.4	1.19 H	128	19.10	31.50
3	*2437.00	107.7 PK			1.19 H	128	76.00	31.70
4	*2437.00	96.5 AV			1.19 H	128	64.80	31.70
5	2483.50	68.2 PK	74.0	-5.8	1.13 H	110	36.30	31.90
6	2483.50	51.2 AV	54.0	-2.8	1.13 H	110	19.30	31.90
7	4874.00	58.4 PK	74.0	-15.6	1.28 H	226	20.60	37.80
8	4874.00	42.1 AV	54.0	-11.9	1.28 H	226	4.30	37.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.6 PK	74.0	-11.4	1.25 V	251	31.10	31.50
2	2390.00	49.4 AV	54.0	-4.6	1.25 V	251	17.90	31.50
3	*2437.00	106.2 PK			1.25 V	251	74.50	31.70
4	*2437.00	95.1 AV			1.25 V	251	63.40	31.70
5	2483.50	63.1 PK	74.0	-10.9	1.00 V	265	31.20	31.90
6	2483.50	50.2 AV	54.0	-3.8	1.00 V	265	18.30	31.90
7	4874.00	59.9 PK	74.0	-14.1	1.28 V	226	22.10	37.80
8	4874.00	44.1 AV	54.0	-9.9	1.28 V	226	6.30	37.80

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.3 PK			1.18 H	213	77.50	31.80
2	*2462.00	98.5 AV			1.18 H	213	66.70	31.80
3	2483.50	71.1 PK	74.0	-2.9	1.18 H	213	39.20	31.90
4	2483.50	50.4 AV	54.0	-3.6	1.18 H	213	18.50	31.90
5	4924.00	46.2 PK	74.0	-27.8	1.10 H	138	8.30	37.90
6	4924.00	33.2 AV	54.0	-20.8	1.10 H	138	-4.70	37.90
7	7386.00	51.9 PK	74.0	-22.1	1.09 H	192	7.80	44.10
8	7386.00	37.5 AV	54.0	-16.5	1.09 H	192	-6.60	44.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.0 PK			1.10 V	55	76.20	31.80
2	*2462.00	96.9 AV			1.10 V	55	65.10	31.80
3	2483.50	71.9 PK	74.0	-2.1	1.10 V	55	40.00	31.90
4	2483.50	49.7 AV	54.0	-4.3	1.10 V	55	17.80	31.90
5	4924.00	51.2 PK	74.0	-22.8	1.00 V	52	13.30	37.90
6	4924.00	34.5 AV	54.0	-19.5	1.00 V	52	-3.40	37.90
7	7386.00	54.9 PK	74.0	-19.1	1.00 V	181	10.80	44.10
8	7386.00	37.9 AV	54.0	-16.1	1.00 V	181	-6.20	44.10

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.



A D T

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.5 PK	74.0	-2.5	1.18 H	310	40.00	31.50
2	2390.00	51.7 AV	54.0	-2.3	1.18 H	310	20.20	31.50
3	*2422.00	106.6 PK			1.15 H	308	75.00	31.60
4	*2422.00	95.6 AV			1.15 H	308	64.00	31.60
5	4844.00	45.3 PK	74.0	-28.7	1.00 H	142	7.60	37.70
6	4844.00	33.3 AV	54.0	-20.7	1.00 H	142	-4.40	37.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.0 PK	74.0	-7.0	1.42 V	63	35.50	31.50
2	2390.00	49.2 AV	54.0	-4.8	1.42 V	63	17.70	31.50
3	*2422.00	105.0 PK			1.42 V	63	73.40	31.60
4	*2422.00	93.2 AV			1.42 V	63	61.60	31.60
5	4844.00	45.6 PK	74.0	-28.4	1.00 V	56	7.90	37.70
6	4844.00	33.3 AV	54.0	-20.7	1.00 V	56	-4.40	37.70

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * ”: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.5 PK	74.0	-16.5	1.21 H	313	26.00	31.50
2	2390.00	45.1 AV	54.0	-8.9	1.21 H	313	13.60	31.50
3	*2437.00	108.0 PK			1.11 H	311	76.30	31.70
4	*2437.00	97.3 AV			1.11 H	311	65.60	31.70
5	2483.50	73.0 PK	74.0	-1.0	1.11 H	311	41.10	31.90
6	2483.50	51.9 AV	54.0	-2.1	1.11 H	311	20.00	31.90
7	4874.00	45.1 PK	74.0	-28.9	1.00 H	148	7.30	37.80
8	4874.00	32.1 AV	54.0	-21.9	1.00 H	148	-5.70	37.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.5 PK	74.0	-17.5	1.45 V	82	25.00	31.50
2	2390.00	45.5 AV	54.0	-8.5	1.45 V	82	14.00	31.50
3	*2437.00	106.5 PK			1.42 V	79	74.80	31.70
4	*2437.00	94.7 AV			1.42 V	79	63.00	31.70
5	2483.50	67.9 PK	74.0	-6.1	1.41 V	79	36.00	31.90
6	2483.50	50.5 AV	54.0	-3.5	1.41 V	79	18.60	31.90
7	4874.00	45.1 PK	74.0	-28.9	1.00 V	54	7.30	37.80
8	4874.00	32.4 AV	54.0	-21.6	1.00 V	54	-5.40	37.80

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	106.1 PK			1.16 H	138	74.30	31.80
2	*2452.00	95.0 AV			1.16 H	138	63.20	31.80
3	2483.50	70.4 PK	74.0	-3.6	1.16 H	138	38.50	31.90
4	2483.50	52.3 AV	54.0	-1.7	1.16 H	138	20.40	31.90
5	4904.00	45.2 PK	74.0	-28.8	1.22 H	35	7.40	37.80
6	4904.00	34.5 AV	54.0	-19.5	1.22 H	35	-3.30	37.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	104.7 PK			1.57 V	23	72.90	31.80
2	*2452.00	92.6 AV			1.57 V	23	60.80	31.80
3	2483.50	66.2 PK	74.0	-7.8	1.57 V	15	34.30	31.90
4	2483.50	50.1 AV	54.0	-3.9	1.57 V	15	18.20	31.90
5	4904.00	43.6 PK	74.0	-30.4	1.07 V	247	5.80	37.80
6	4904.00	33.1 AV	54.0	-20.9	1.07 V	247	-4.70	37.80

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.



A D T

BELOW 1GHz WORST-CASE DATA : 802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	222.38	36.0 QP	46.0	-10.0	1.25 H	199	24.70	11.30
2	253.49	42.1 QP	46.0	-3.9	1.25 H	286	29.40	12.70
3	280.71	38.4 QP	46.0	-7.6	1.00 H	118	24.50	13.90
4	479.03	32.8 QP	46.0	-13.2	2.00 H	226	13.70	19.10
5	624.85	33.4 QP	46.0	-12.6	1.50 H	226	11.00	22.40
6	720.12	34.1 QP	46.0	-11.9	1.00 H	64	10.70	23.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.00	35.8 QP	40.0	-4.2	1.00 V	154	23.80	12.00
2	125.17	35.7 QP	43.5	-7.8	1.00 V	208	23.70	12.00
3	239.88	32.1 QP	46.0	-13.9	1.50 V	178	20.00	12.10
4	500.42	37.4 QP	46.0	-8.6	1.00 V	280	17.70	19.70
5	624.85	33.6 QP	46.0	-12.4	1.00 V	196	11.20	22.40
6	720.12	31.9 QP	46.0	-14.1	1.50 V	331	8.50	23.40

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	TESTED BY	Anderson Hong
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	59.06	28.3 QP	40.0	-11.7	1.00 H	52	15.30	13.00
2	249.60	37.6 QP	46.0	-8.4	1.00 H	121	25.00	12.60
3	479.03	33.2 QP	46.0	-12.8	1.25 H	307	14.10	19.10
4	500.42	35.3 QP	46.0	-10.7	1.25 H	307	15.60	19.70
5	624.85	33.7 QP	46.0	-12.3	2.00 H	1	11.30	22.40
6	720.12	34.4 QP	46.0	-11.6	1.00 H	223	11.00	23.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	60.22	37.5 QP	40.0	-2.5	1.01 V	43	24.60	12.90
2	241.83	30.6 QP	46.0	-15.4	1.00 V	37	18.40	12.20
3	479.03	34.1 QP	46.0	-11.9	1.00 V	304	15.00	19.10
4	624.85	34.7 QP	46.0	-11.3	1.00 V	100	12.30	22.40
5	720.12	31.8 QP	46.0	-14.2	1.50 V	163	8.40	23.40
6	875.67	31.0 QP	46.0	-15.0	1.25 V	28	5.30	25.70

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBµV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTE:** 1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Nov. 30, 2010	Nov. 29, 2011
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 30, 2010	Dec. 29, 2011
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Jul. 07, 2011	Jul. 06, 2012
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 06, 2011	Jan. 05, 2012
LISN ROHDE & SCHWARZ	ESH3-Z5	835239/001	Feb. 22, 2011	Feb. 21, 2012
V-LISN SCHWARZBECK	NNBL 8226-2	8226-142	Jun. 30, 2011	Jun. 29, 2012
LISN ROHDE & SCHWARZ	ENV216	100072	Jun. 10, 2011	Jun. 09, 2012
Software ADT	ADT_Cond_ V7.3.7	NA	NA	NA

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 1.
 3. The VCCI Site Registration No. is C-2040.



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4.2.3 TEST PROCEDURES

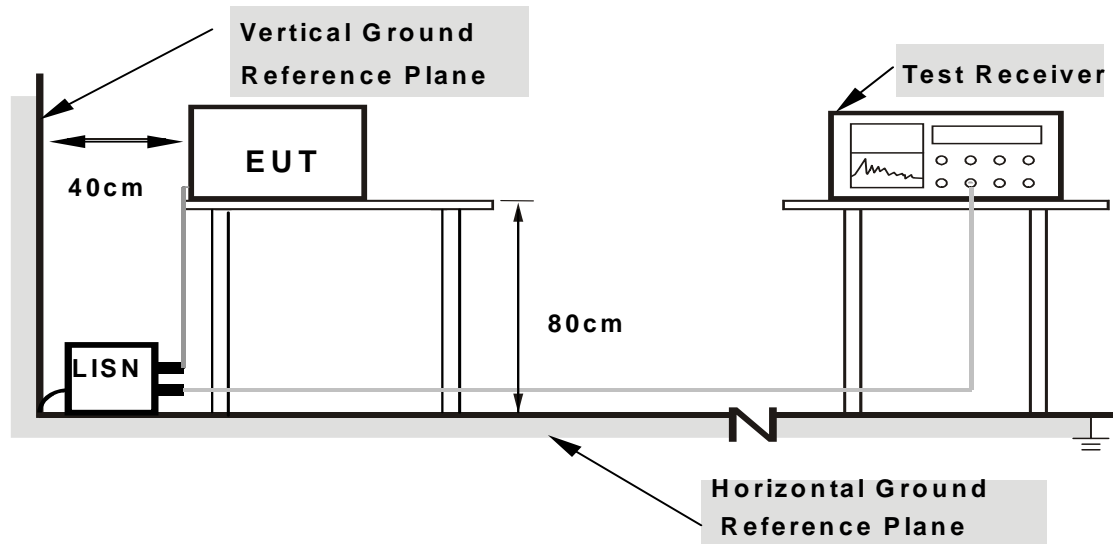
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

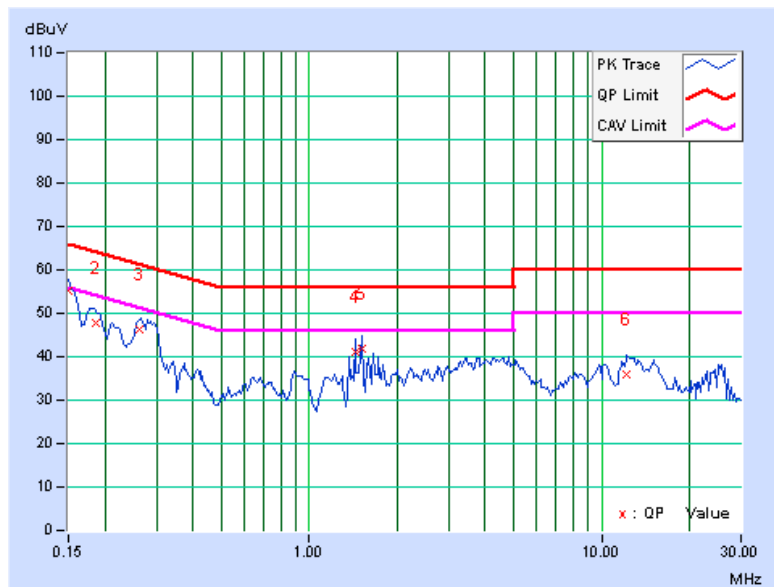
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA : 802.11g

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.17	54.89	47.07	55.06	47.24	66.00	56.00	-10.94	-8.76
2	0.185	0.15	47.54	39.15	47.69	39.30	64.25	54.25	-16.56	-14.95
3	0.263	0.17	46.14	39.38	46.31	39.55	61.32	51.32	-15.01	-11.77
4	1.441	0.22	40.79	31.58	41.01	31.80	56.00	46.00	-14.99	-14.20
5	1.512	0.22	41.69	31.28	41.91	31.50	56.00	46.00	-14.09	-14.50
6	12.227	0.82	35.21	30.05	36.03	30.87	60.00	50.00	-23.97	-19.13

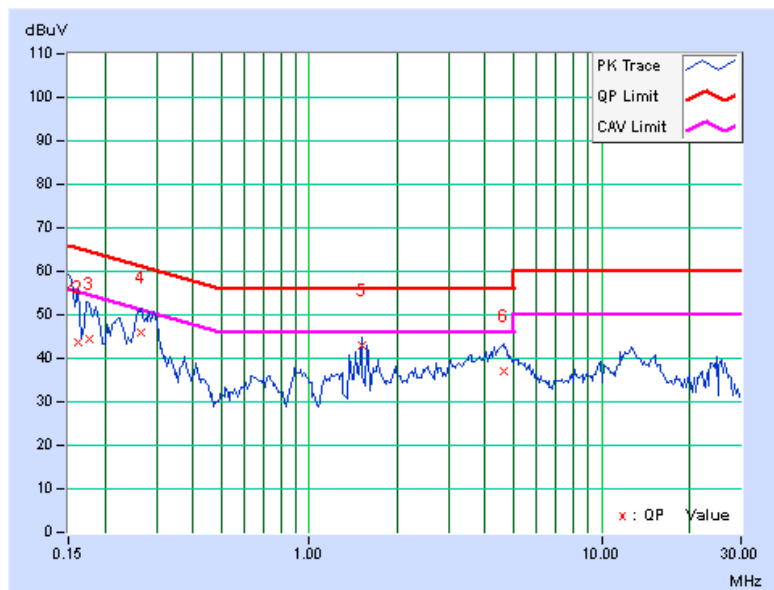
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.23	56.23	48.10	56.46	48.33	66.00	56.00	-9.54	-7.67
2	0.162	0.22	43.63	32.76	43.85	32.98	65.38	55.38	-21.52	-22.39
3	0.177	0.22	44.07	32.90	44.29	33.12	64.61	54.61	-20.32	-21.49
4	0.267	0.22	45.74	38.66	45.96	38.88	61.20	51.20	-15.25	-12.33
5	1.512	0.29	42.60	32.54	42.89	32.83	56.00	46.00	-13.11	-13.17
6	4.605	0.46	36.75	31.58	37.21	32.04	56.00	46.00	-18.79	-13.96

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



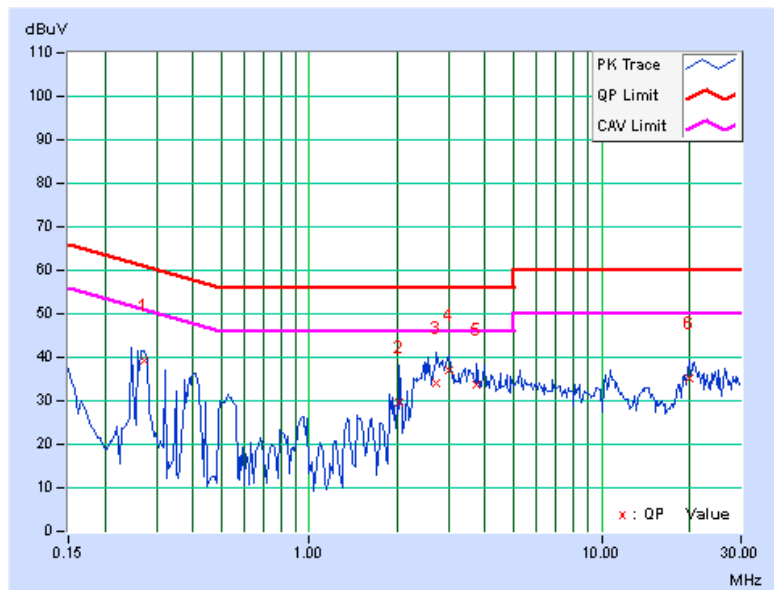


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PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.271	0.18	39.12	30.89	39.30	31.07	61.08	51.08	-21.79	-20.02
2	2.031	0.24	29.50	17.83	29.74	18.07	56.00	46.00	-26.26	-27.93
3	2.734	0.30	33.86	24.96	34.16	25.26	56.00	46.00	-21.84	-20.74
4	3.004	0.32	36.62	31.67	36.94	31.99	56.00	46.00	-19.06	-14.01
5	3.754	0.37	33.30	31.58	33.67	31.95	56.00	46.00	-22.33	-14.05
6	20.008	1.22	33.88	30.72	35.10	31.94	60.00	50.00	-24.90	-18.06

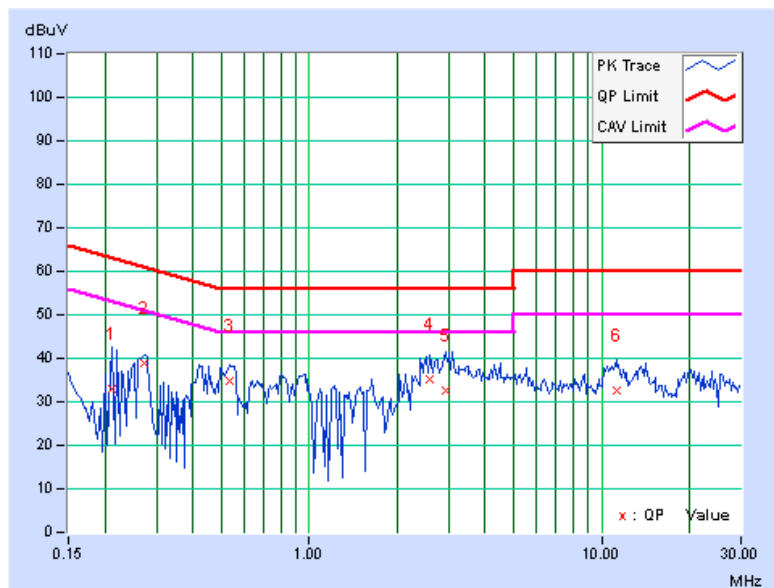
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.213	0.21	32.74	9.15	32.95	9.36	63.11	53.11	-30.16	-43.75
2	0.271	0.22	38.56	37.44	38.78	37.66	61.08	51.08	-22.31	-13.43
3	0.533	0.24	34.72	23.76	34.96	24.00	56.00	46.00	-21.04	-22.00
4	2.590	0.34	34.74	26.59	35.08	26.93	56.00	46.00	-20.92	-19.07
5	2.934	0.36	32.32	16.79	32.68	17.15	56.00	46.00	-23.32	-28.85
6	11.227	0.73	31.81	24.44	32.54	25.17	60.00	50.00	-27.46	-24.83

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.





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4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100039	Feb. 23, 2011	Feb. 22, 2012

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



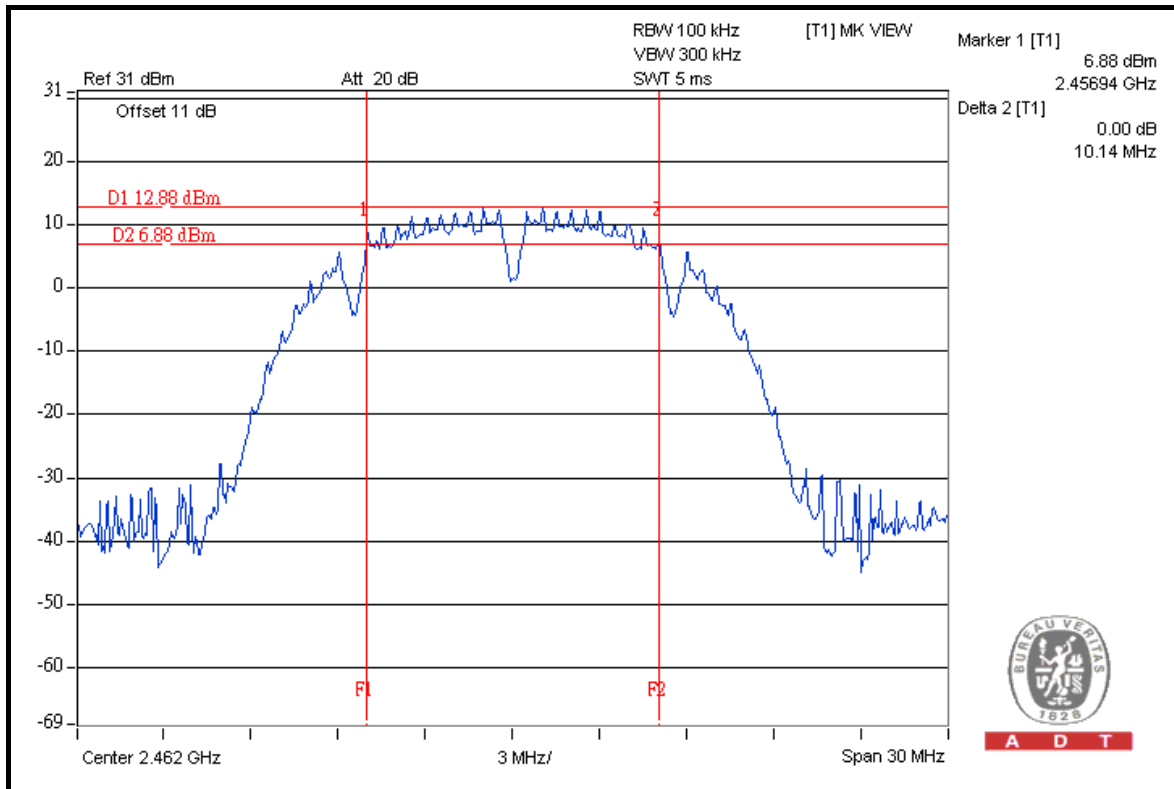
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4.3.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	10.11	10.13	0.5	PASS
6	2437	10.13	10.13	0.5	PASS
11	2462	9.64	10.14	0.5	PASS

CHAIN 1: CH 11



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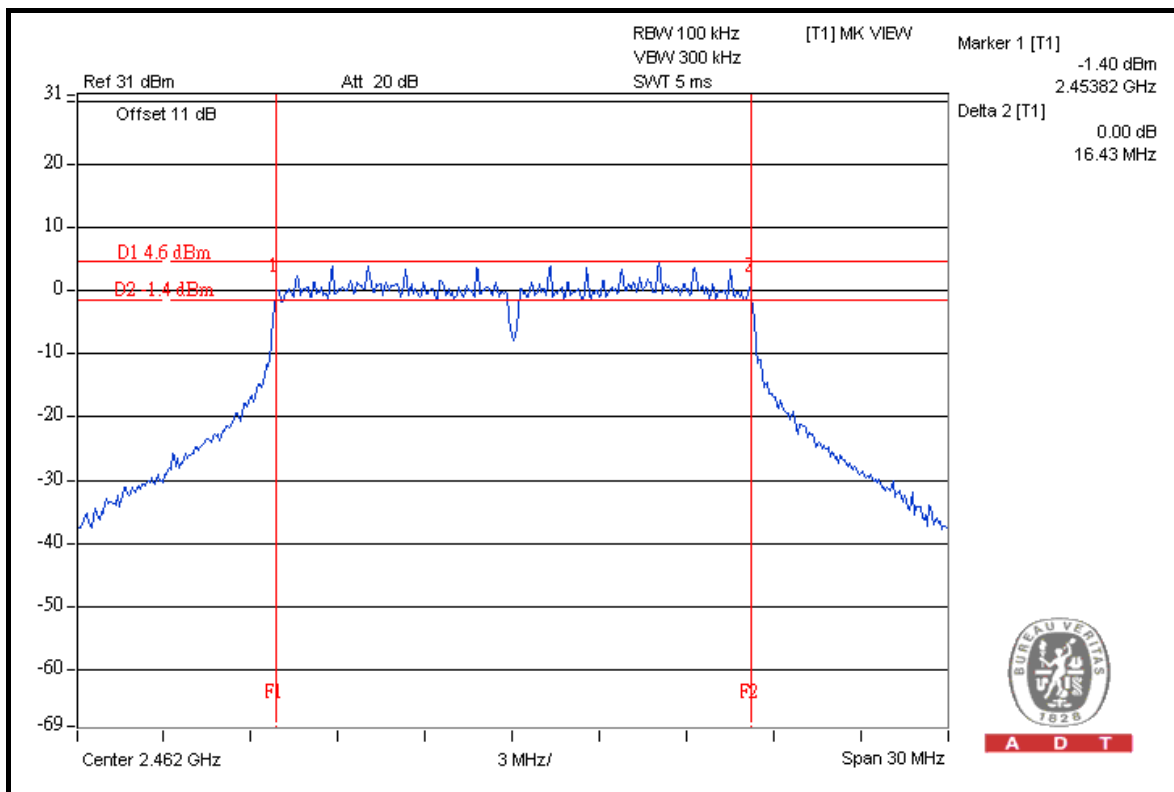


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802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.41	16.42	0.5	PASS
6	2437	16.39	16.36	0.5	PASS
11	2462	12.06	16.43	0.5	PASS

CHAIN 1: CH 11



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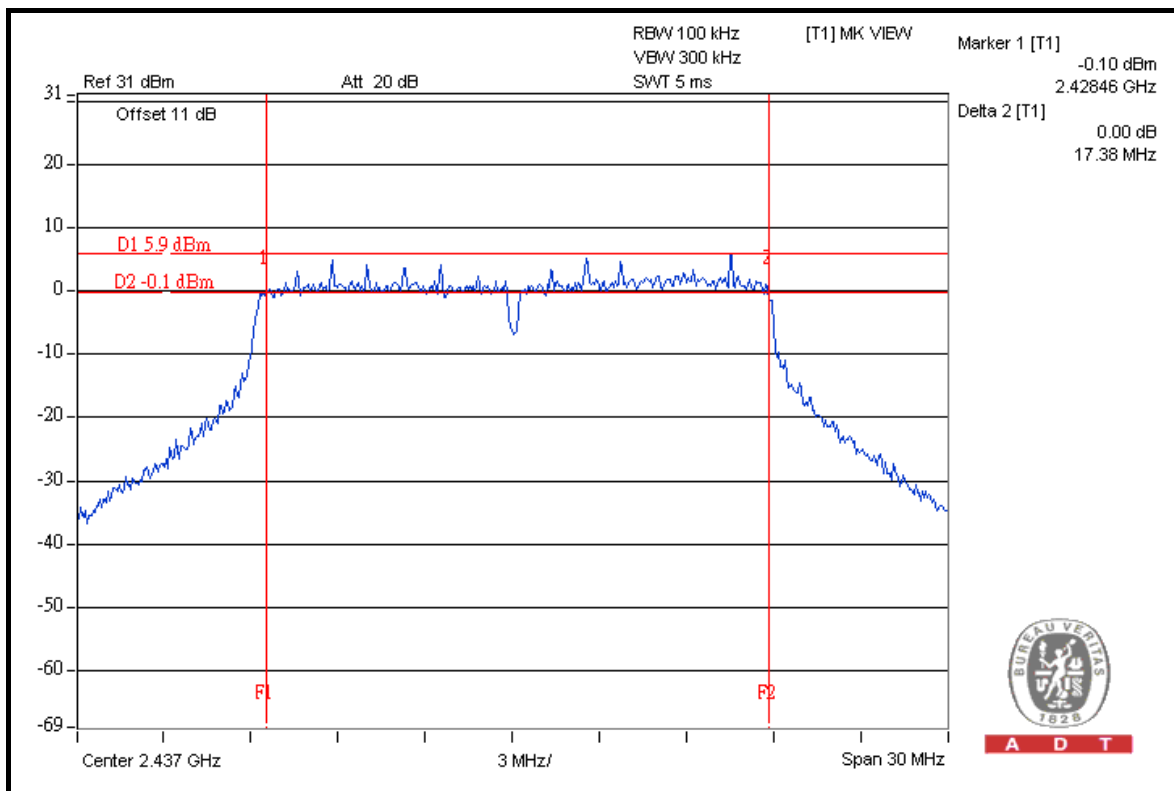


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802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.37	17.36	0.5	PASS
6	2437	17.38	16.15	0.5	PASS
11	2462	15.20	17.34	0.5	PASS

FOR CHAIN 0: CH 6



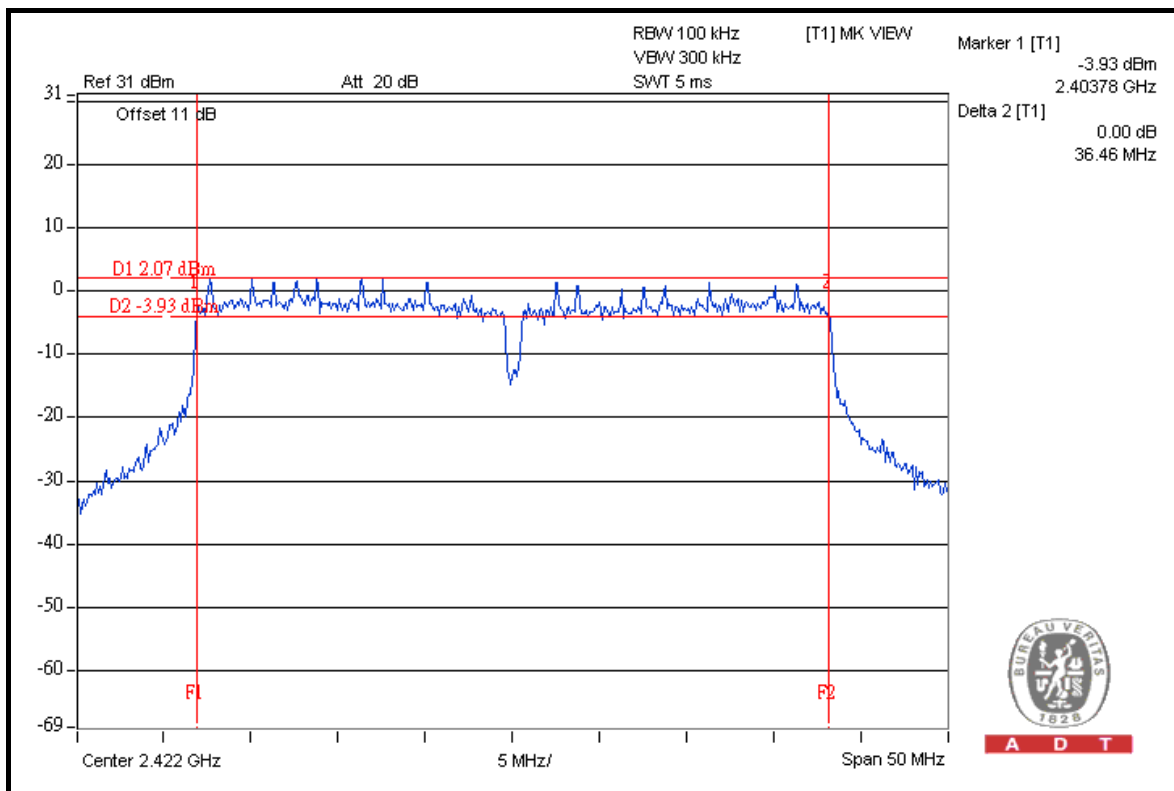


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802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2422	36.46	34.27	0.5	PASS
4	2437	36.19	35.36	0.5	PASS
7	2452	33.05	35.94	0.5	PASS

FOR CHAIN 0: CH 1



4.4 MAXIMUM OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT

The Maximum Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
High Speed Peak Power Meter	ML2495A	0824011	Aug. 04, 2011	Aug. 03, 2012
Power Sensor	MA2411B	0738171	Aug. 04, 2011	Aug. 03, 2012

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Measurement Bandwidth of ML2495A is 65MHz greater than 6dB bandwidth of emission.

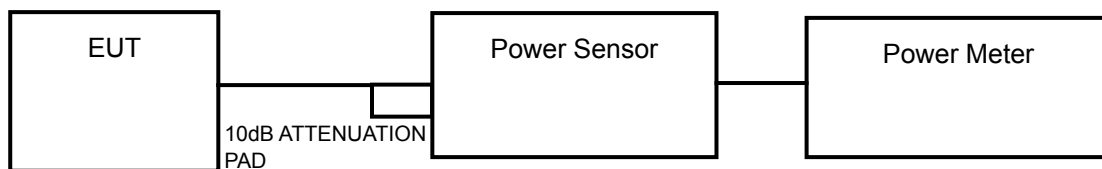
4.4.3 TEST PROCEDURES

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.



4.4.7 TEST RESULTS

802.11b

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	27.4	24.5	831.4	29.2	30	PASS
6	2437	26.0	23.7	632.5	28.0	30	PASS
11	2462	25.7	24.9	680.6	28.3	30	PASS

NOTE: Directional gain = $3\text{dBi} + 10\log(2) = 6.0\text{dBi} = 6\text{dBi}$, so the conducted power limit is not reduced.

802.11g

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	27.3	25.7	908.6	29.6	30	PASS
6	2437	27.0	24.9	810.2	29.1	30	PASS
11	2462	27.4	26.4	986.1	29.9	30	PASS

NOTE: Directional gain = $3\text{dBi} + 10\log(2) = 6.0\text{dBi} = 6\text{dBi}$, so the conducted power limit is not reduced.

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	27.0	25.5	856.0	29.3	30	PASS
6	2437	26.9	25.0	806.0	29.1	30	PASS
11	2462	26.9	26.3	916.4	29.6	30	PASS

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2422	26.4	25.5	791.3	29.0	30	PASS
4	2437	27.4	25.5	904.4	29.6	30	PASS
7	2452	26.0	24.7	693.2	28.4	30	PASS



A D T

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100039	Feb. 23, 2011	Feb. 22, 2012

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

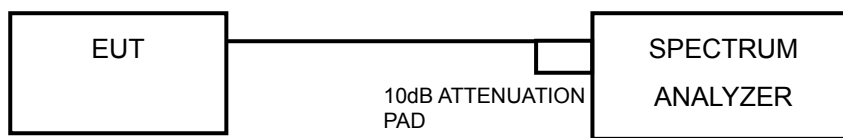
The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

Follow method 2 of KDB 662911 D01 Multiple Transmitter Output v01 to calculate total power density of 2 TX port.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6



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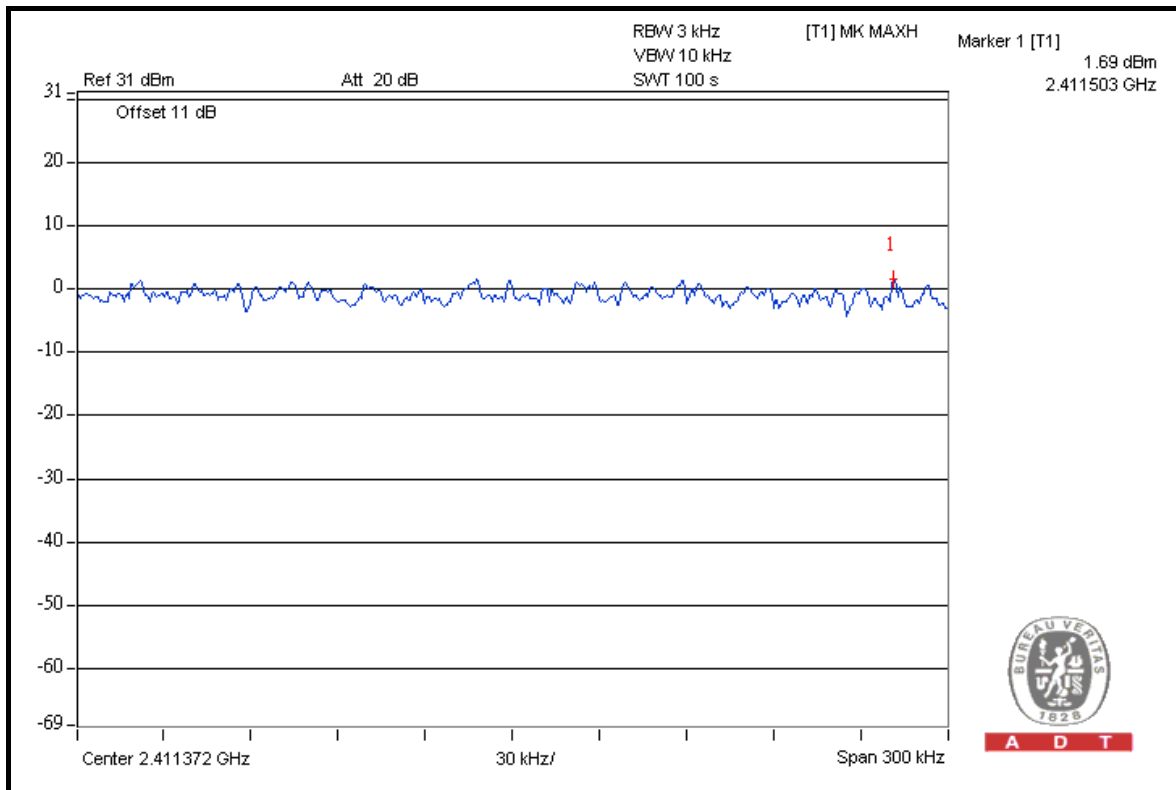
4.5.7 TEST RESULTS

802.11b

CHAIN	CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
			MEASURED	10 log (N=2) dB			
0	1	2412	1.69	3.01	4.70	8	PASS
	6	2437	0.14	3.01	3.15	8	PASS
	11	2462	-0.24	3.01	2.77	8	PASS
1	1	2412	-1.76	3.01	1.25	8	PASS
	6	2437	-2.40	3.01	0.61	8	PASS
	11	2462	-1.28	3.01	1.73	8	PASS

NOTE: Directional gain = 3dBi + 10log(2) = 6.0dBi = 6dBi , so the power density limit is not reduced.

FOR CHAIN 0: CH 1



A D T



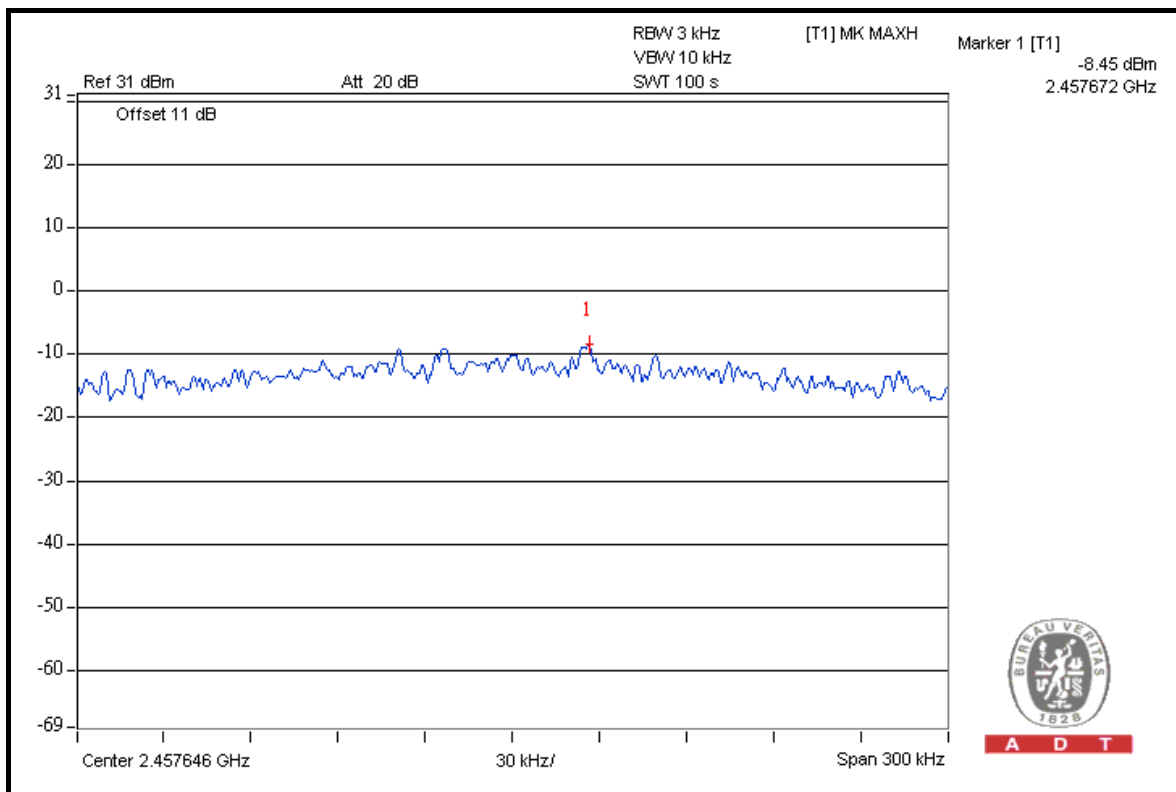
A D T

802.11g

CHAIN	CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
			MEASURED	10 log (N=2) dB			
0	1	2412	-8.49	3.01	-5.48	8	PASS
	6	2437	-8.88	3.01	-5.87	8	PASS
	11	2462	-8.45	3.01	-5.44	8	PASS
1	1	2412	-10.02	3.01	-7.01	8	PASS
	6	2437	-10.64	3.01	-7.63	8	PASS
	11	2462	-9.39	3.01	-6.38	8	PASS

NOTE: Directional gain = 3dBi + 10log(2) = 6.0dBi = 6dBi , so the power density limit is not reduced.

FOR CHAIN 0: CH 11



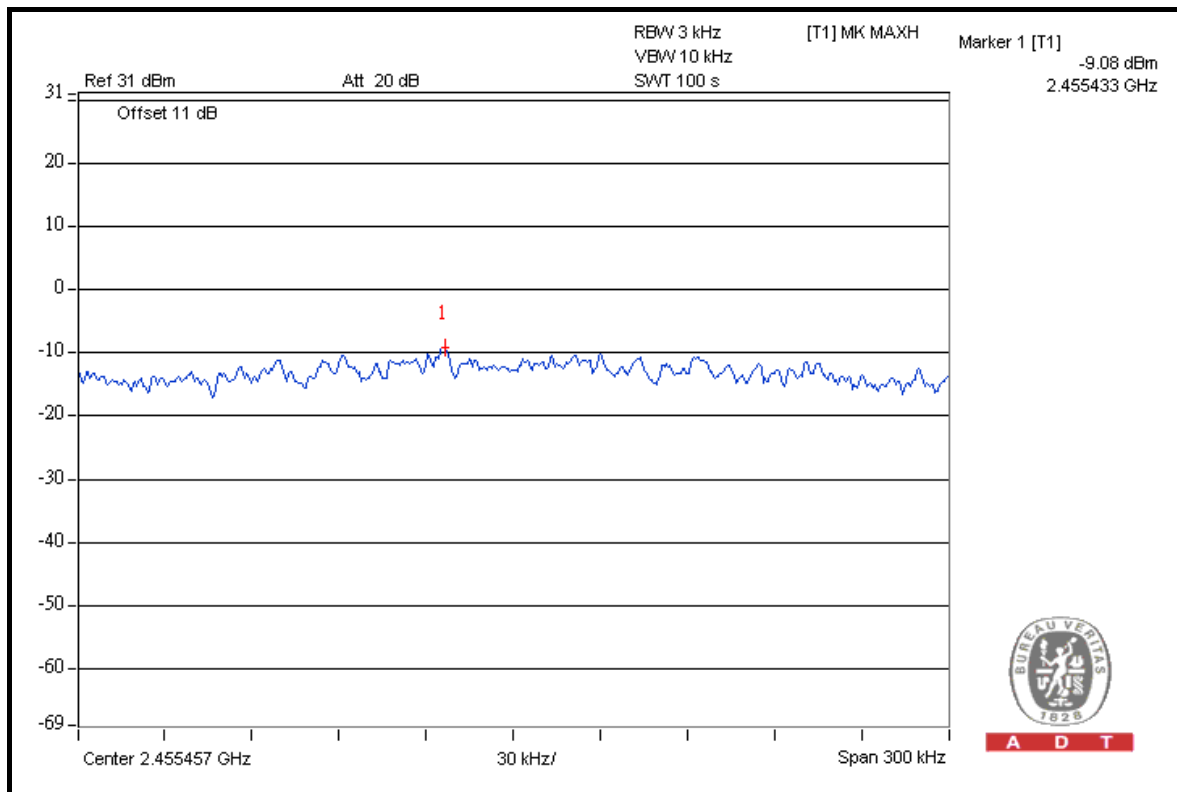


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802.11n (20MHz)

CHAIN	CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
			MEASURED	10 log (N=2) dB			
0	1	2412	-9.15	3.01	-6.14	8	PASS
	6	2437	-9.27	3.01	-6.26	8	PASS
	11	2462	-9.08	3.01	-6.07	8	PASS
1	1	2412	-11.14	3.01	-8.13	8	PASS
	6	2437	-11.45	3.01	-8.44	8	PASS
	11	2462	-10.15	3.01	-7.14	8	PASS

FOR CHAIN 0: CH 11



A D T

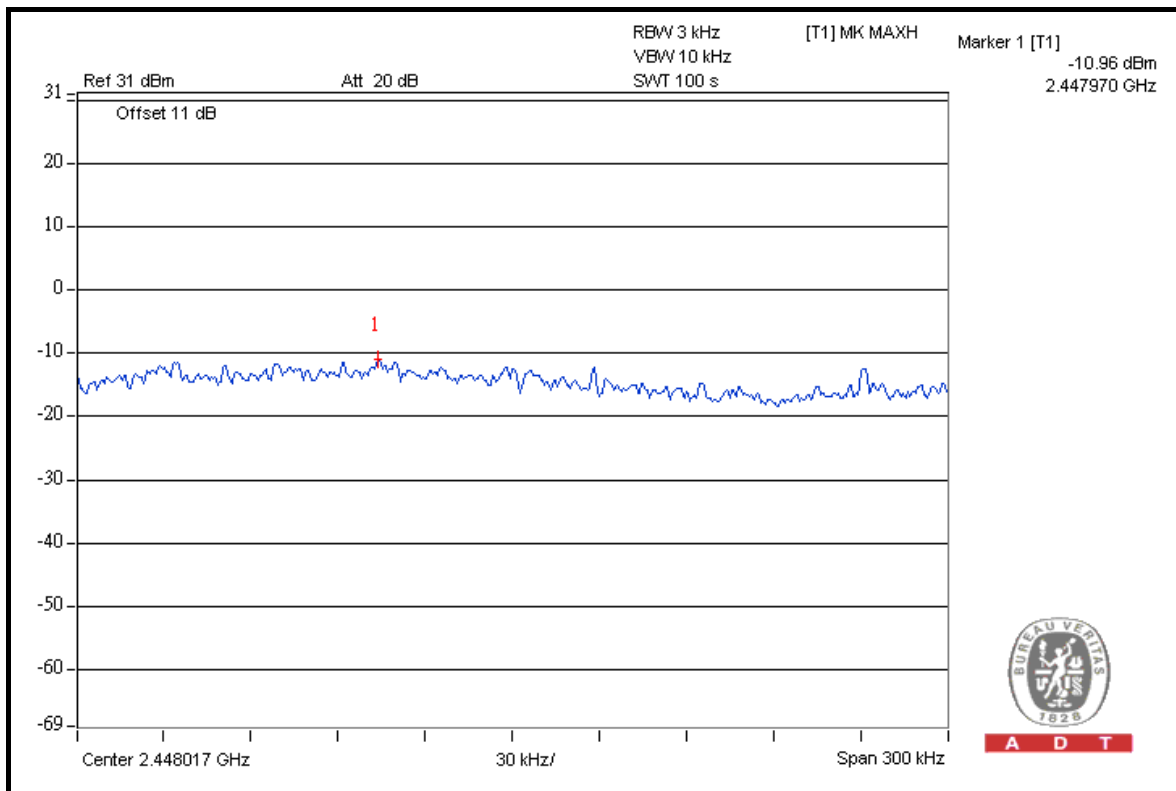


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802.11n (40MHz)

CHAIN	CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
			MEASURED	10 log (N=2) dB			
0	1	2422	-12.19	3.01	-9.18	8	PASS
	4	2437	-10.96	3.01	-7.95	8	PASS
	7	2452	-12.42	3.01	-9.41	8	PASS
1	1	2422	-12.83	3.01	-9.82	8	PASS
	4	2437	-12.61	3.01	-9.60	8	PASS
	7	2452	-13.41	3.01	-10.40	8	PASS

FOR CHAIN 0: CH 4



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4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100744	Apr. 19, 2011	Apr. 18, 2012
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jan. 06, 2011	Jan. 05, 2012
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Apr. 12, 2011	Apr. 11, 2012
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-563	Sep. 06, 2011	Sep. 05, 2012
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 27, 2010	Dec. 26, 2011
Preamplifier Agilent	8449B	3008A01911	Nov. 03, 2010	Nov. 02, 2011
Preamplifier Agilent	8447D	2944A10638	Nov. 03, 2010	Nov. 02, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295013/4 283403/4	Aug. 19, 2011	Aug. 18, 2012
RF signal cable Worken	8D-FB	Cable-HYCH9-01	Aug. 13, 2011	Aug. 12, 2012
Software	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn Table Controller EMCO	2090	NA	NA	NA
Turn Table Controller ADT.	SC100.	SC93021704	NA	NA

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.



4.6.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW = 100kHz, VBW = 300kHz) are attached on the following pages.

NOTE: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6.



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4.6.6 TEST RESULTS

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement in part 15.247(d).

802.11b

RESTRICT BAND (2310 ~ 2390 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	113.8	54.95	58.85	74.00
2412.00 (AV)	109.7	58.59	51.11	54.00

RESTRICT BAND (2483.5 ~ 2500 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	112.2	55.19	57.01	74.00
2462.00 (AV)	108.0	61.00	47.00	54.00

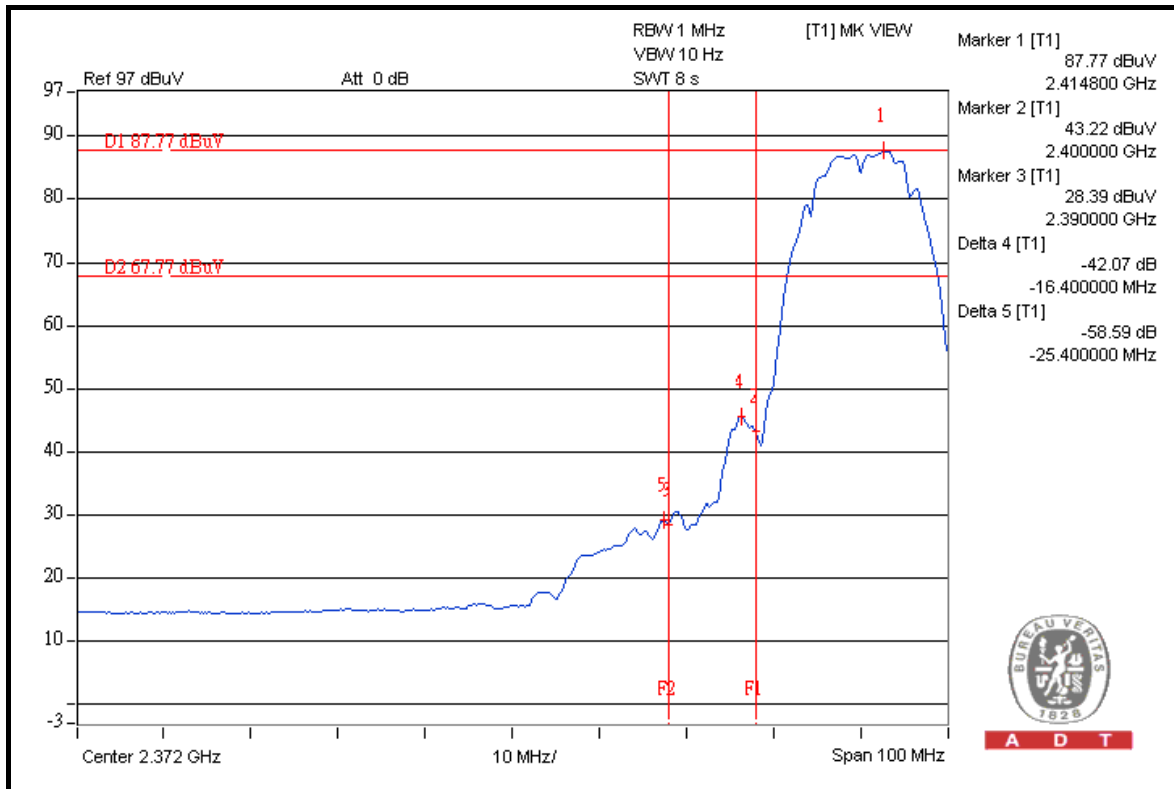
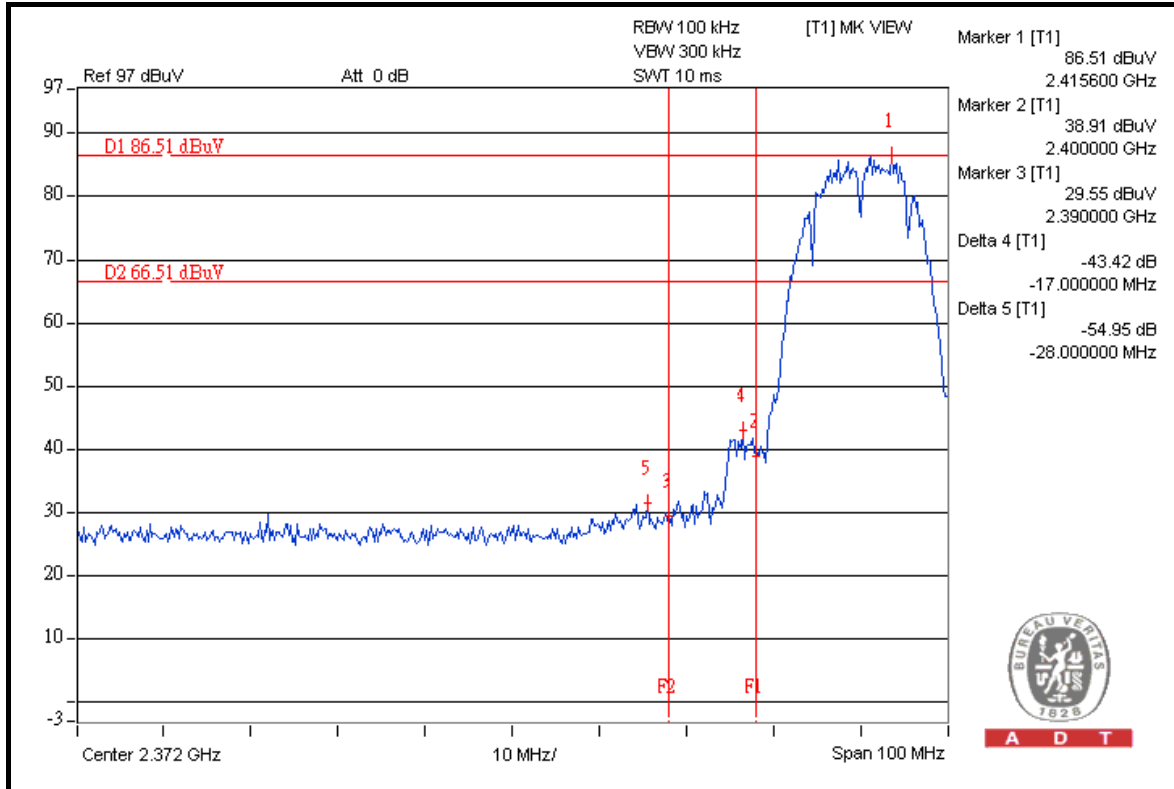
NOTE:

1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.



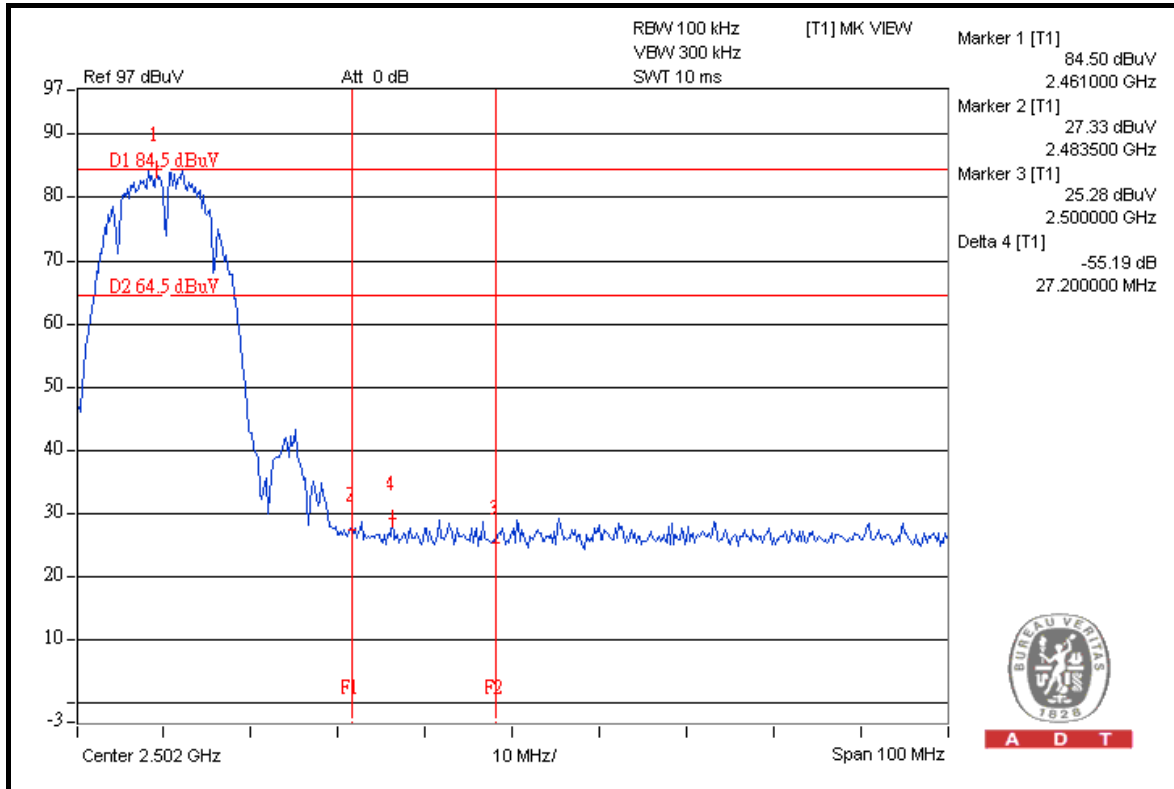
A D T

FOR RADIATED MEASURED (BOTH CHAINS ON)

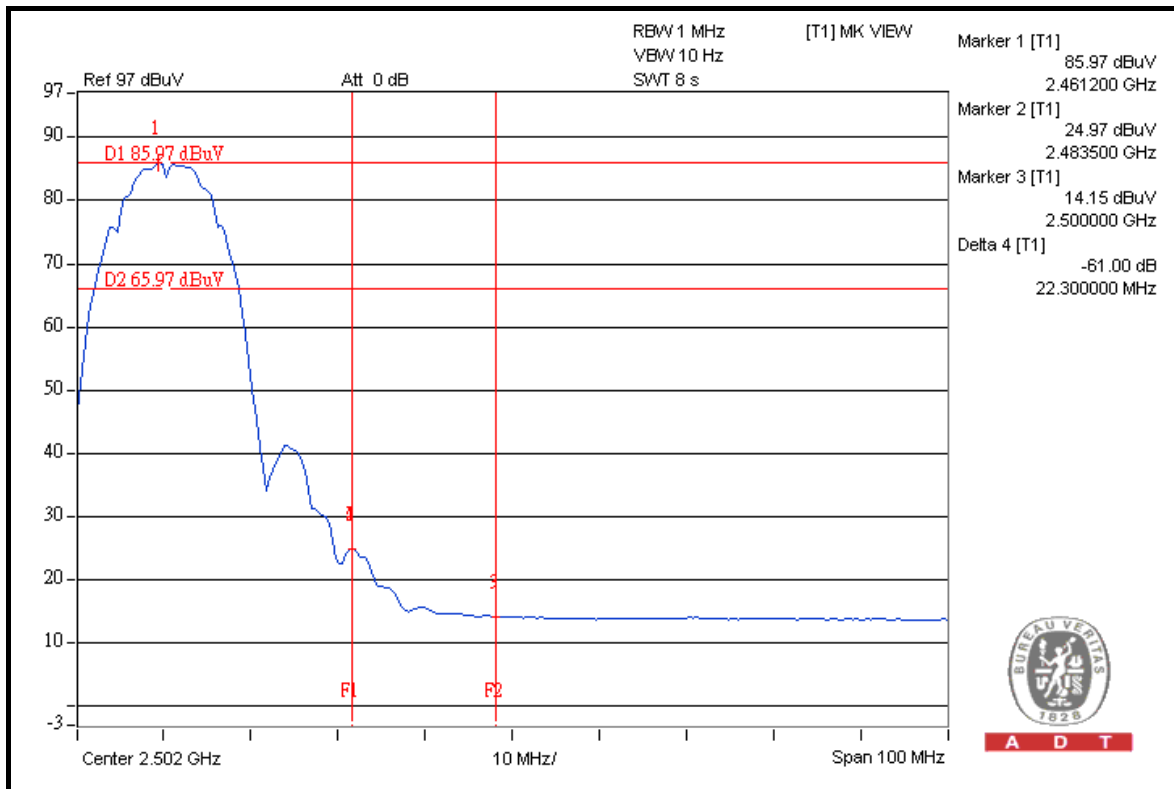




A D T



A D T



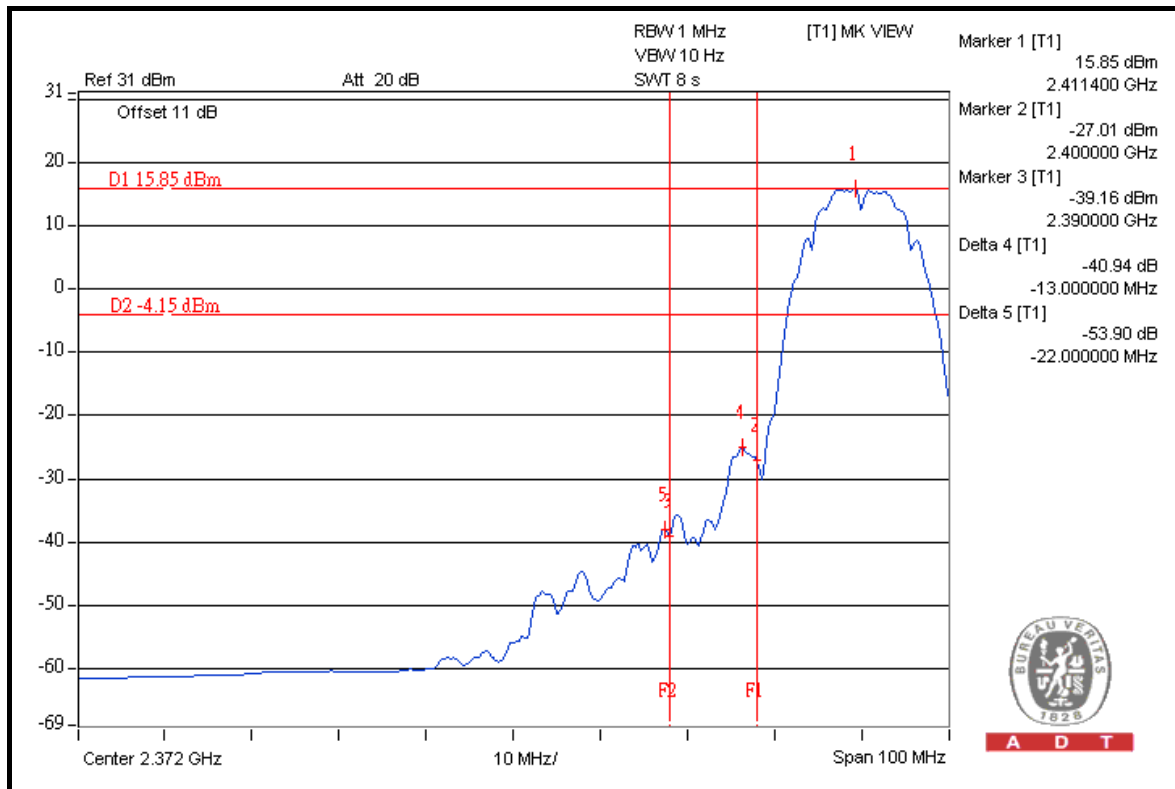
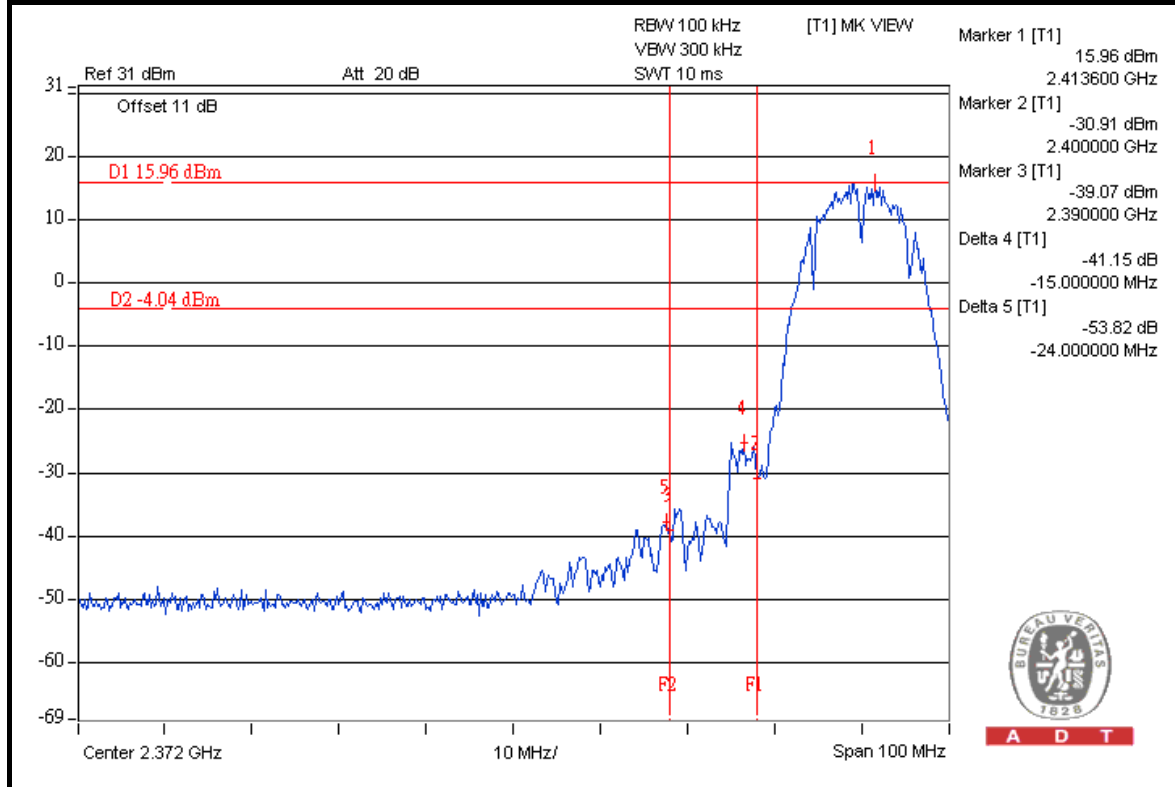
A D T



A D T

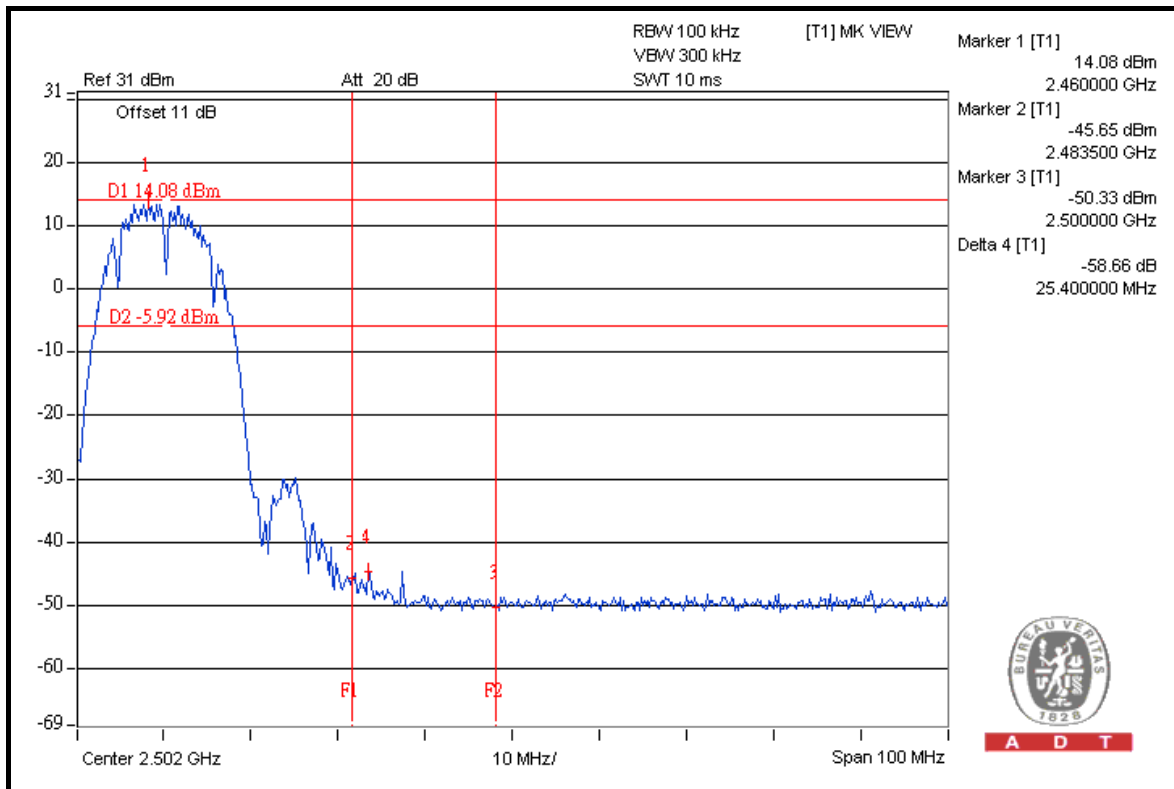
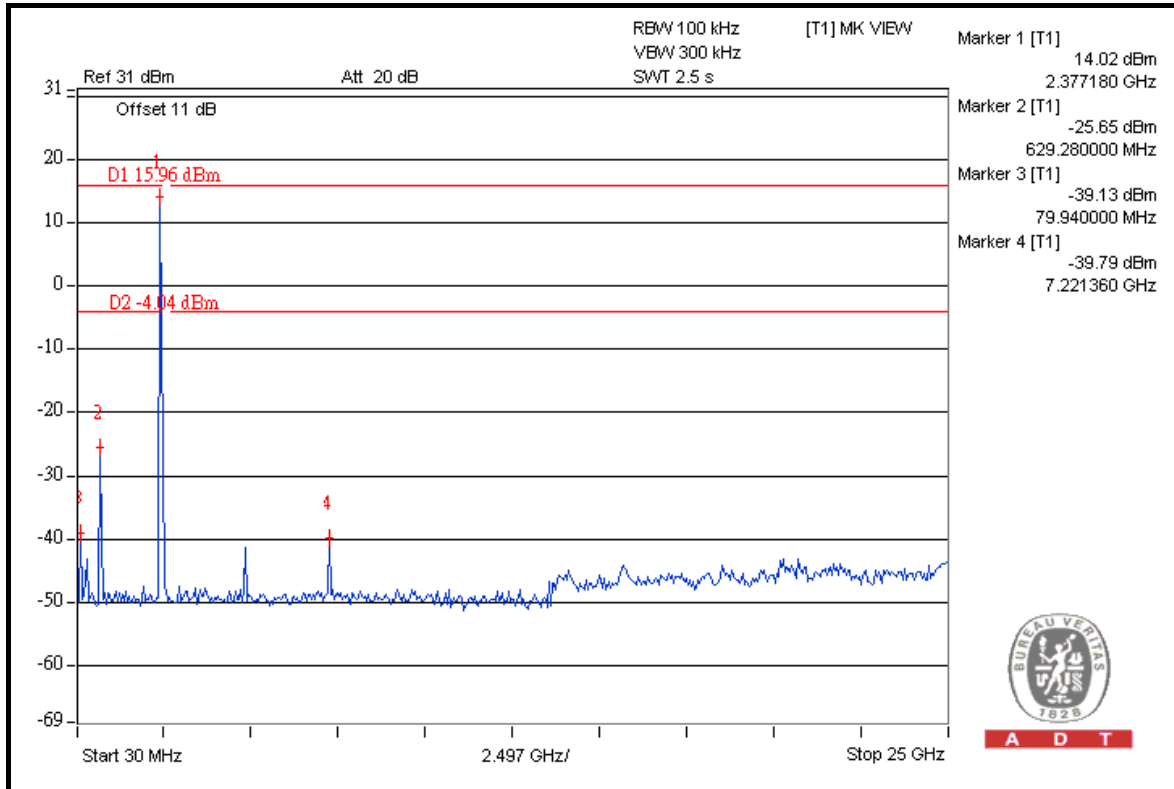
FOR CONDUCTED MEASURED

CHAIN 0



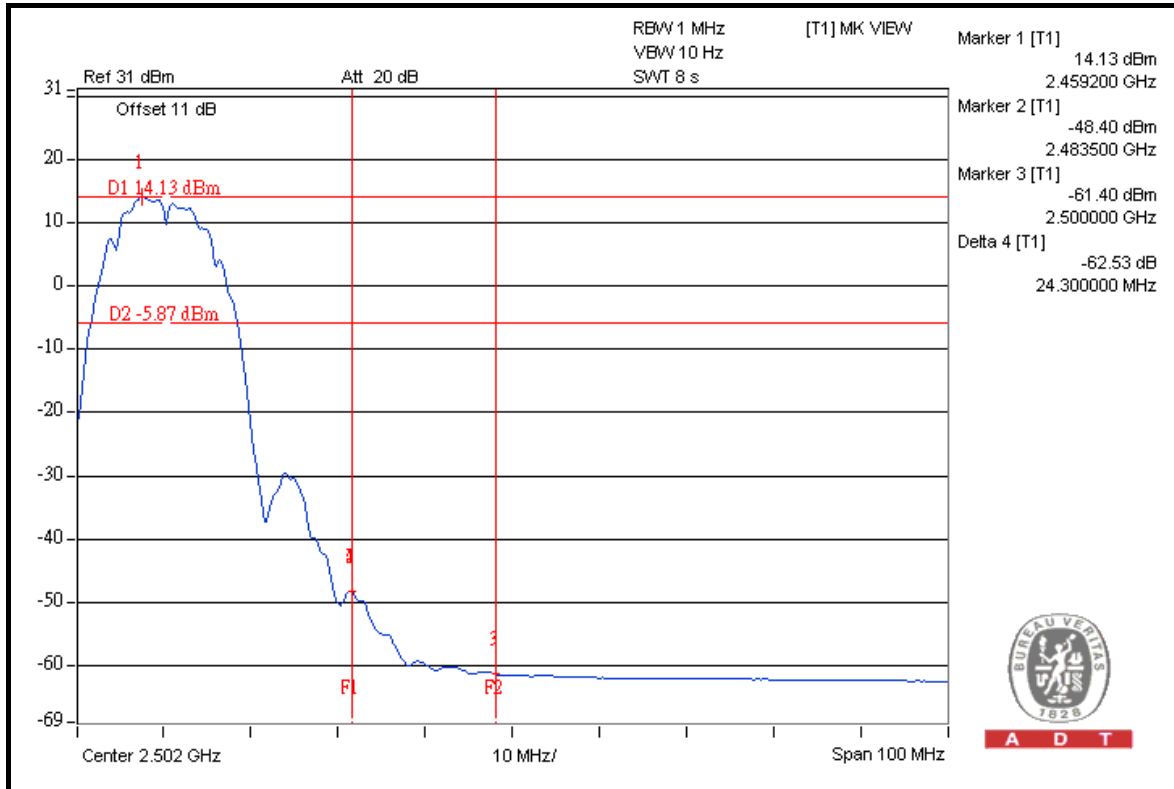


A D T

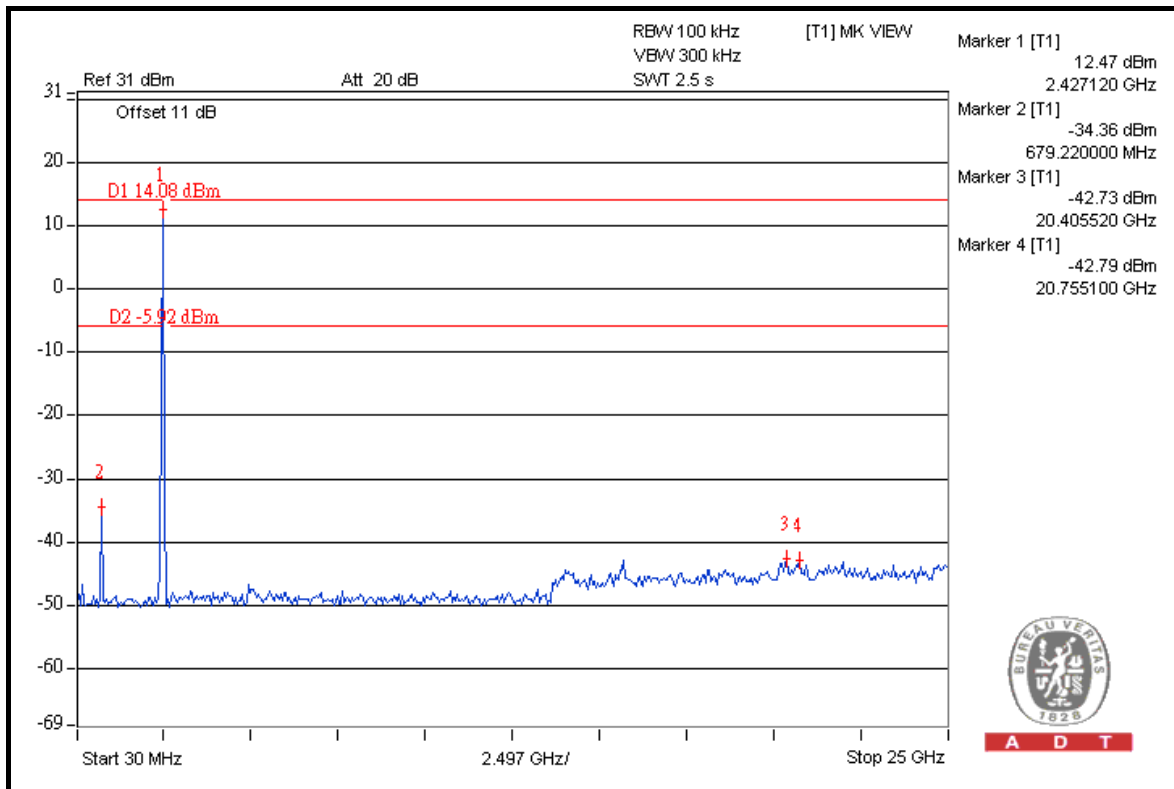




A D T



A D T

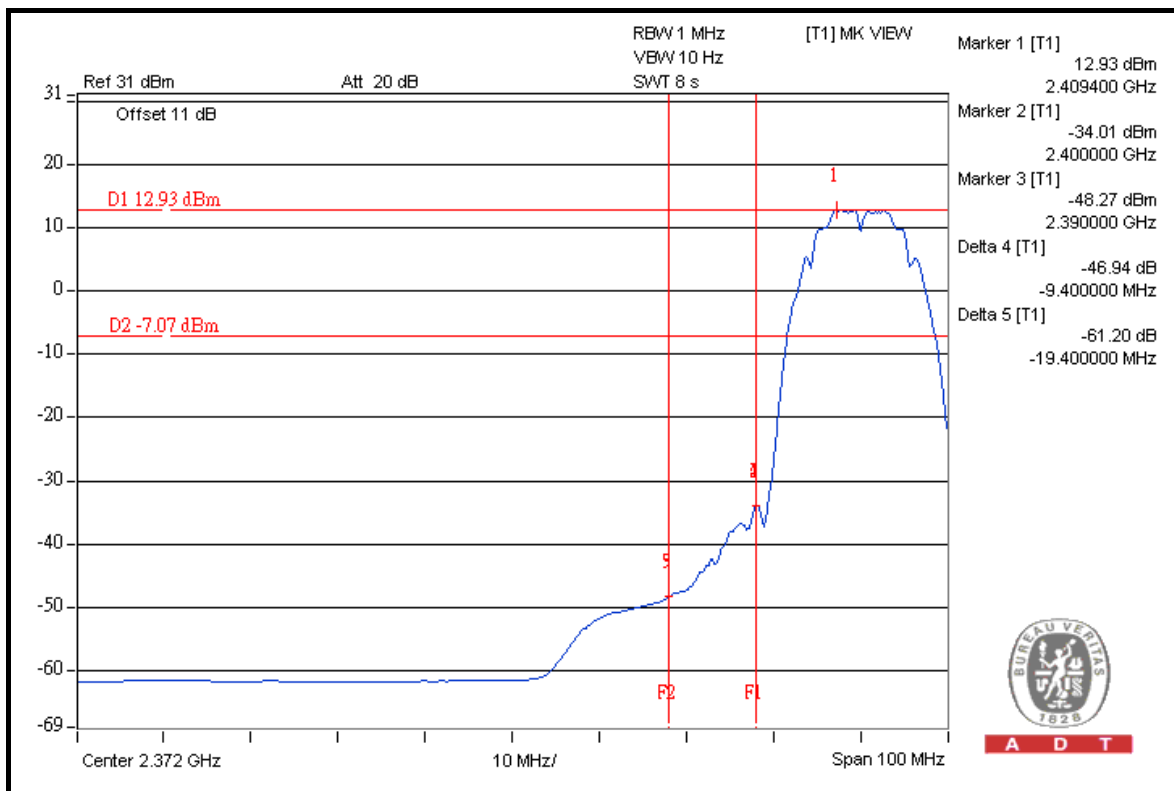
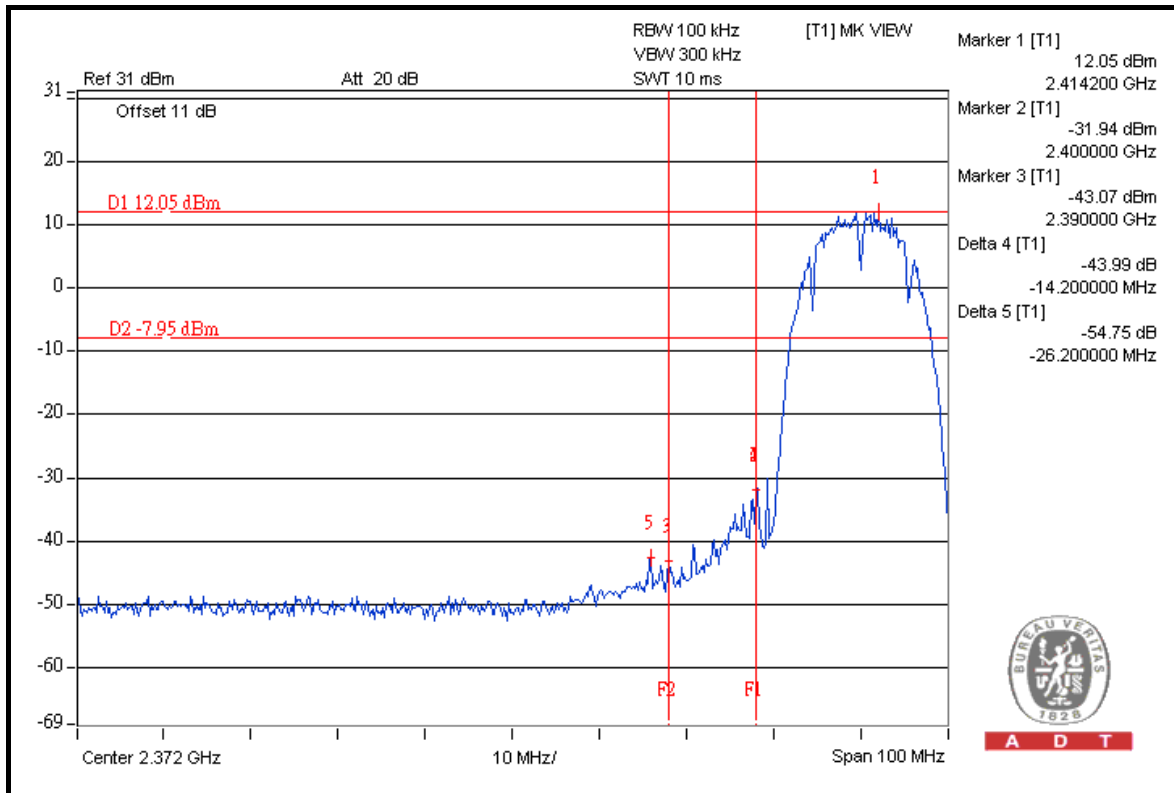


A D T



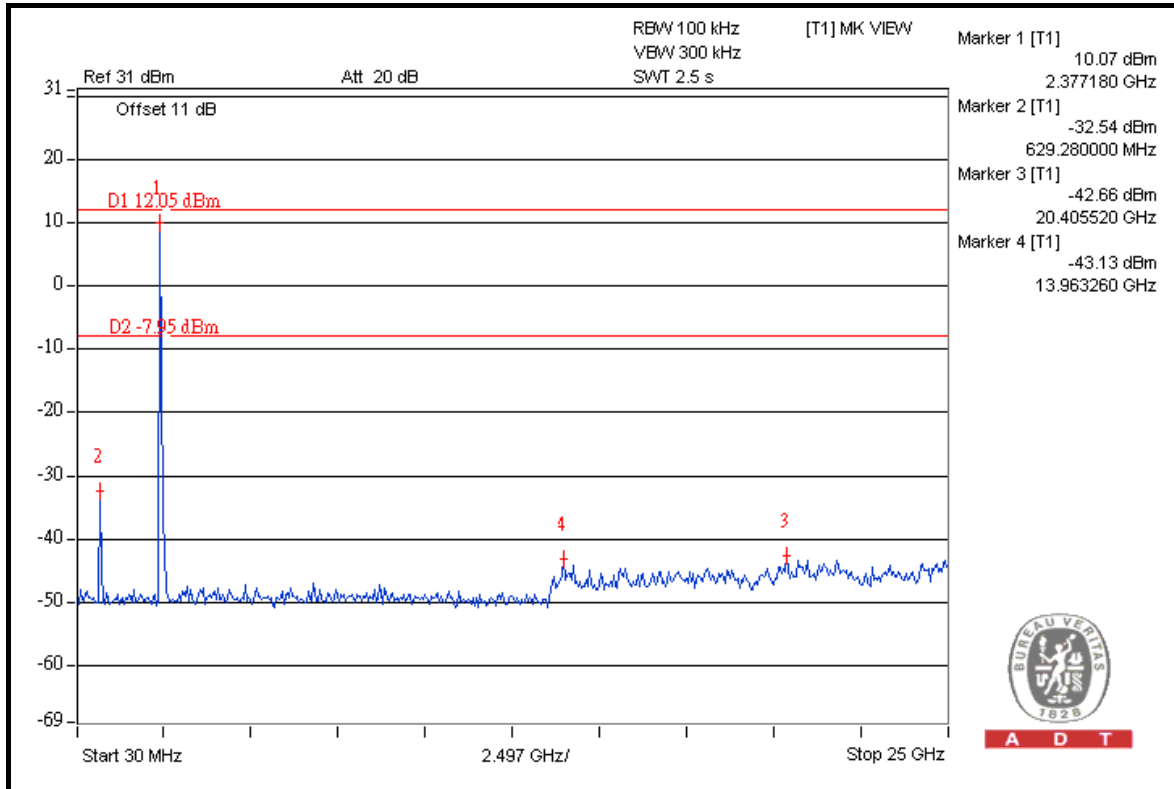
A D T

CHAIN 1

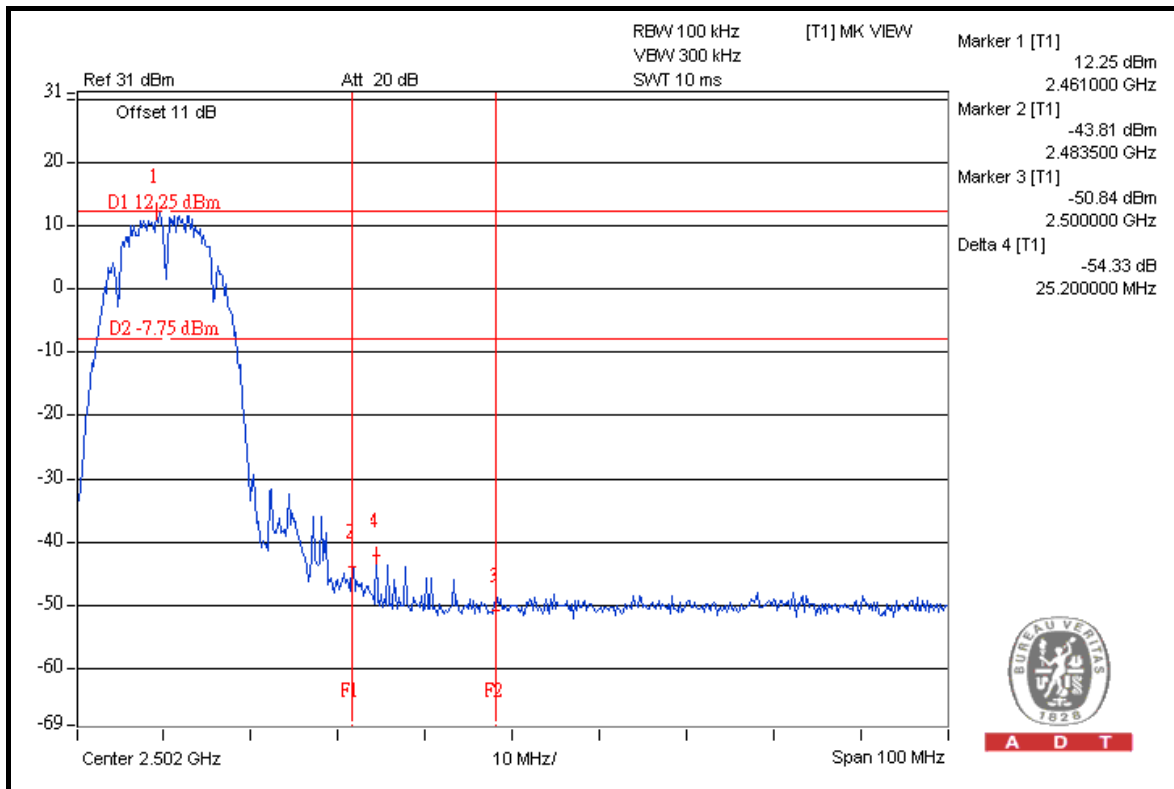




A D T



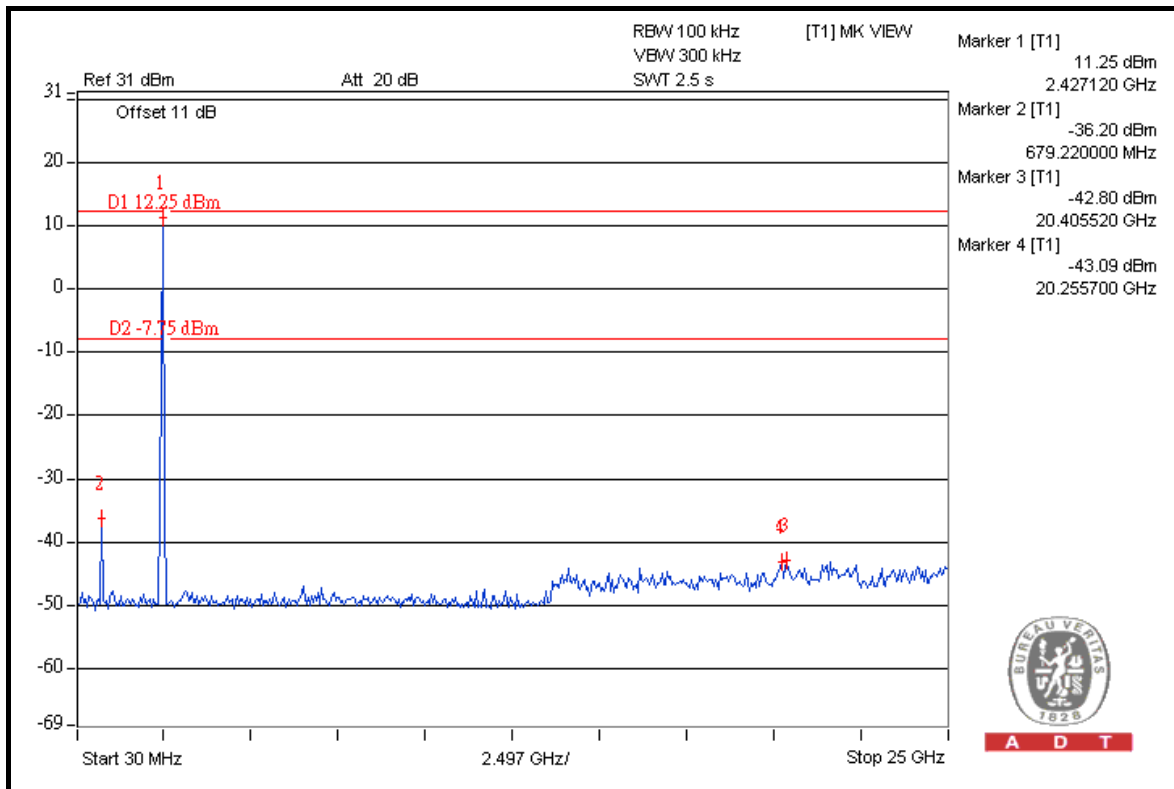
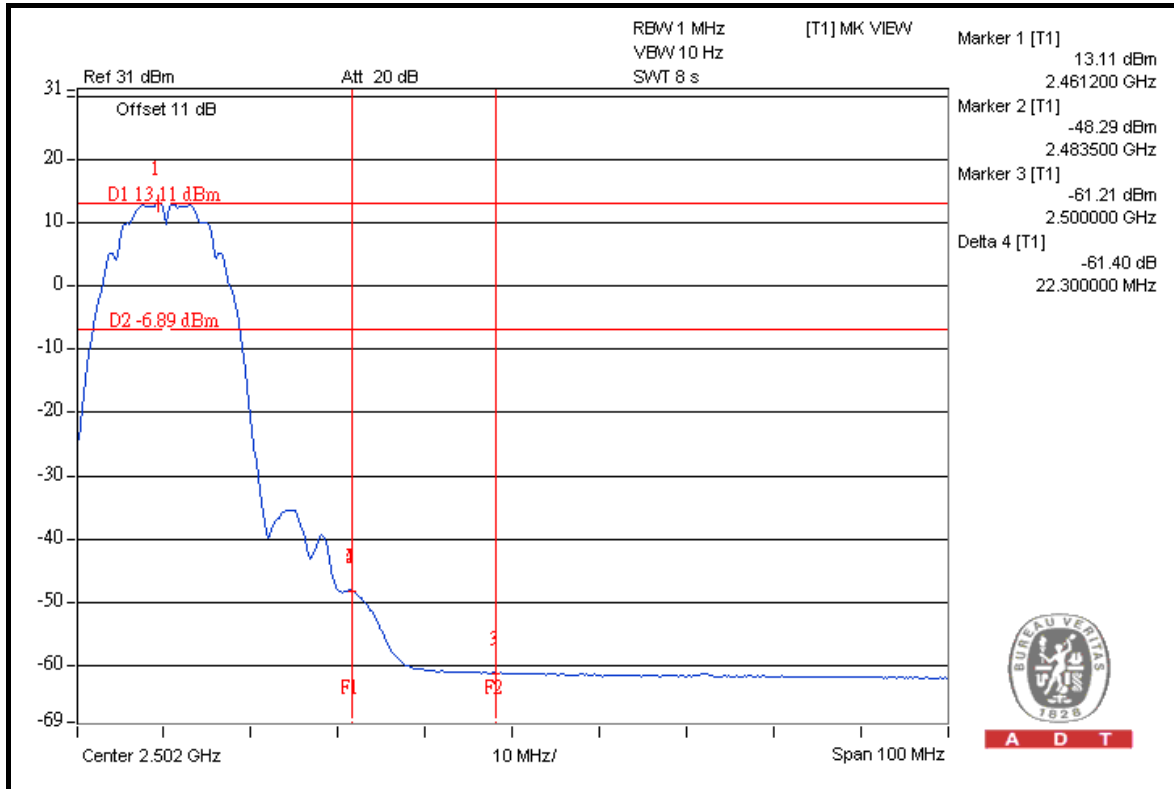
A D T



A D T



A D T





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802.11g

RESTRICT BAND (2310 ~ 2390 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	108.7	42.27	66.43	74.00
2412.00 (AV)	97.6	48.06	49.54	54.00

RESTRICT BAND (2483.5 ~ 2500 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	110.5	45.32	65.18	74.00
2462.00 (AV)	99.4	50.96	48.44	54.00

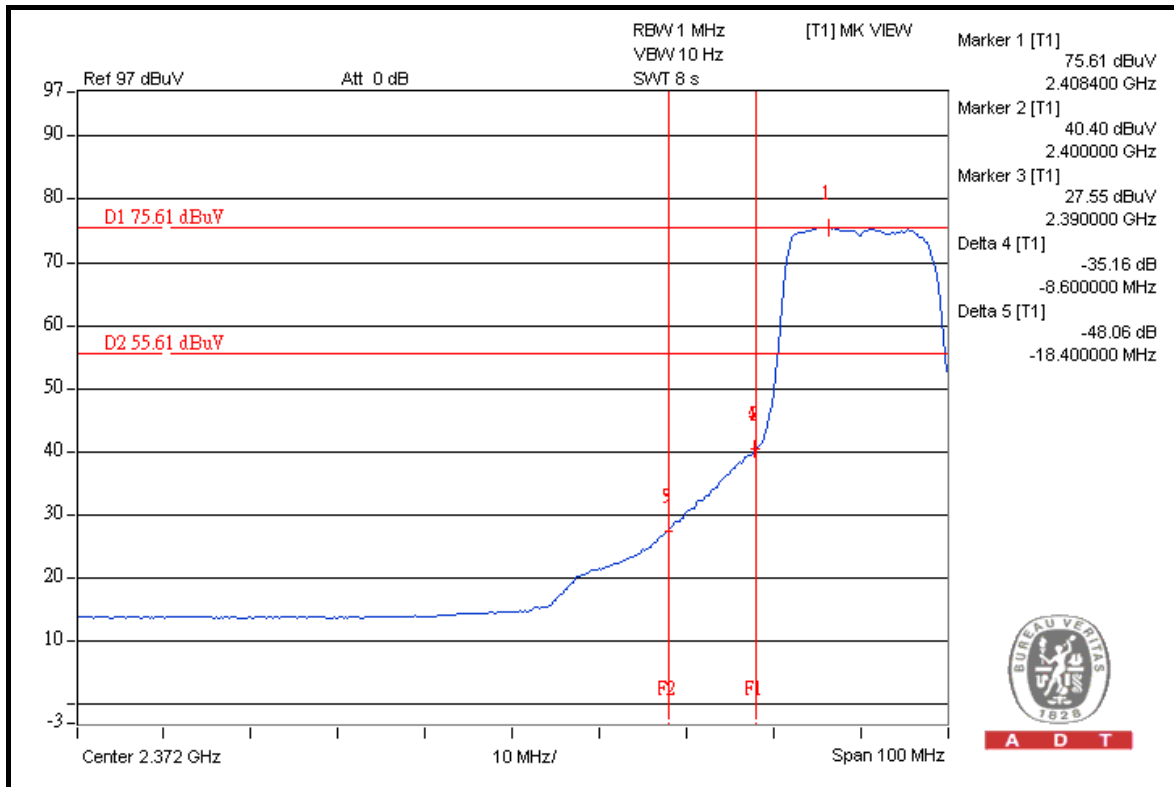
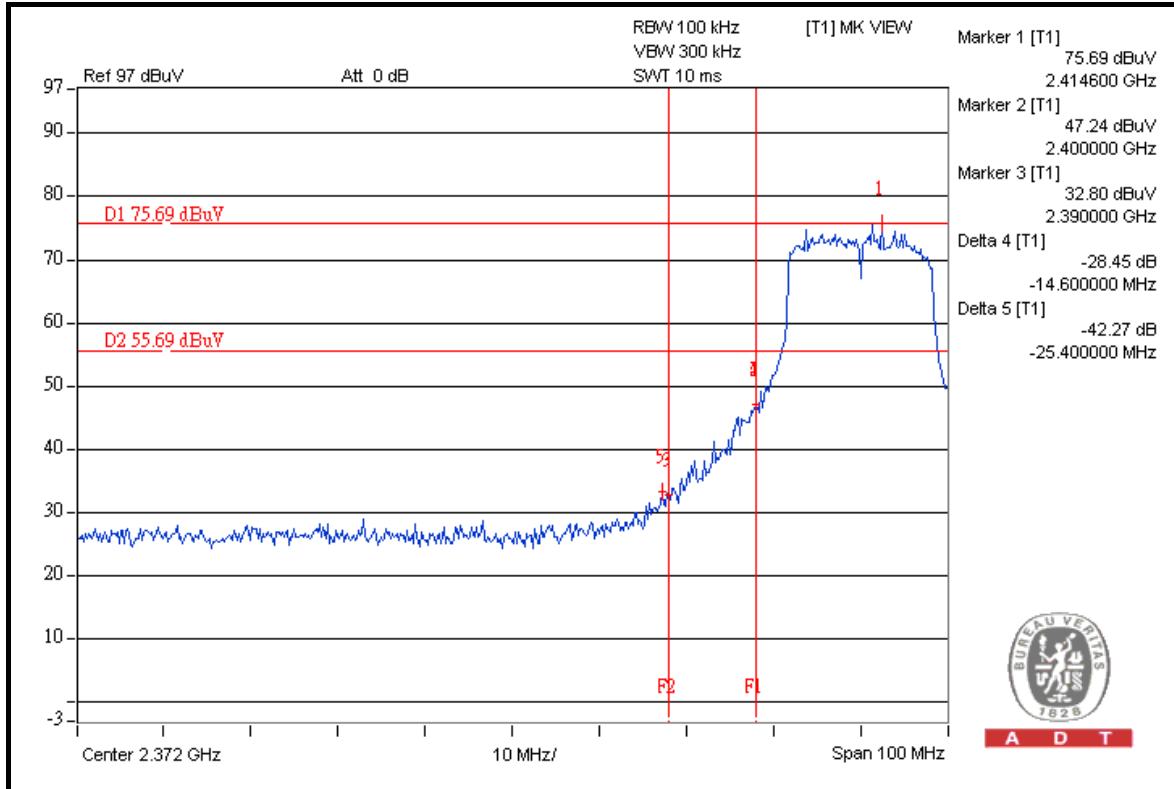
NOTE:

1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.



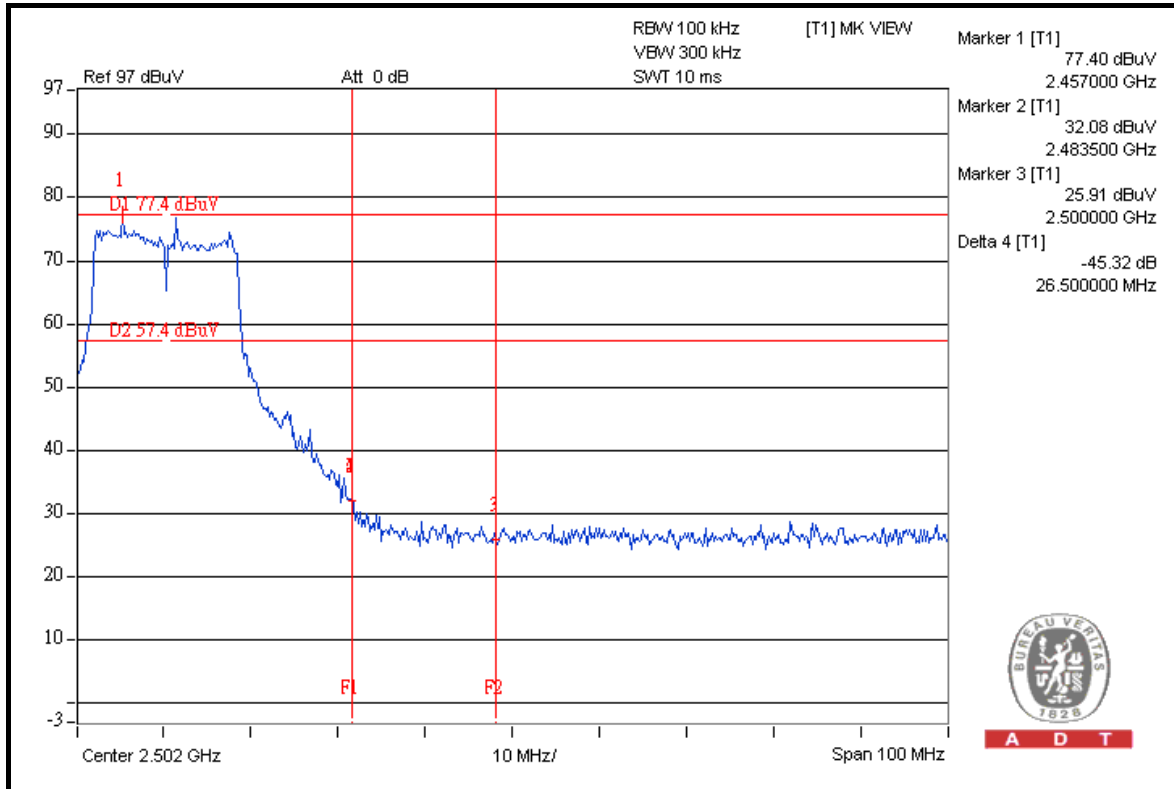
A D T

FOR RADIATED MEASURED (BOTH CHAINS ON)

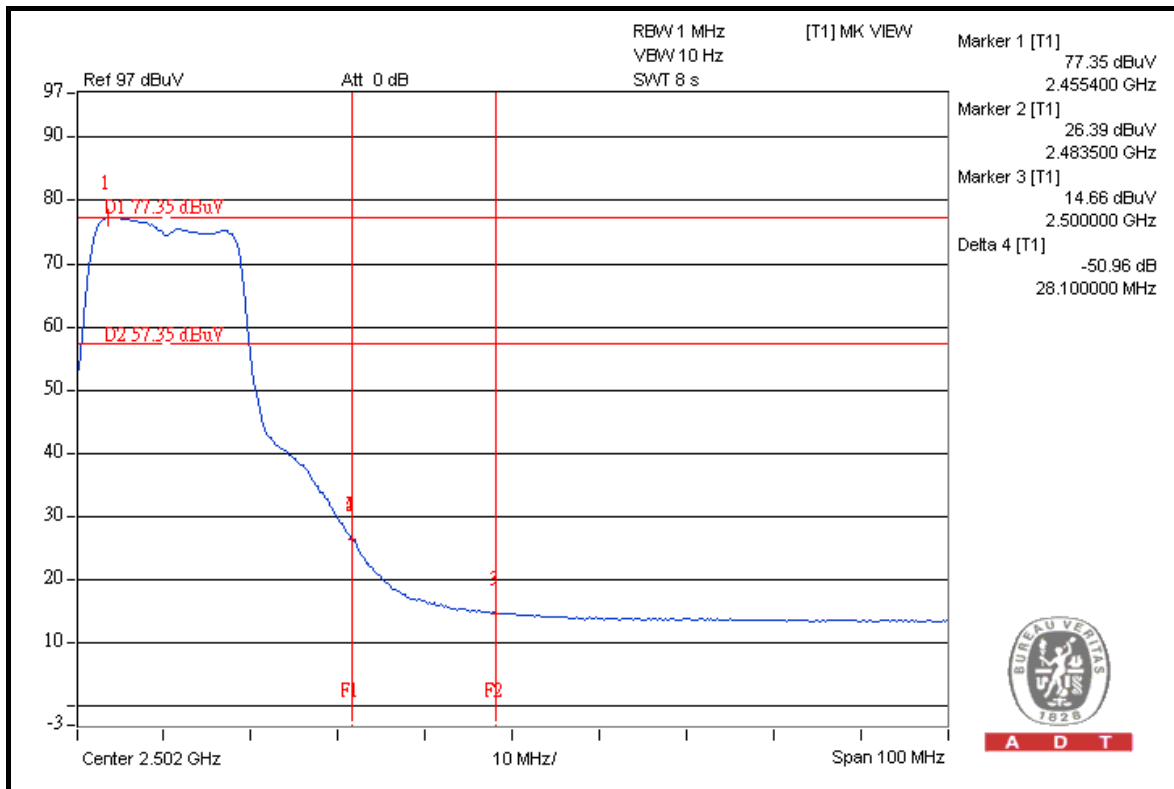




A D T



A D T



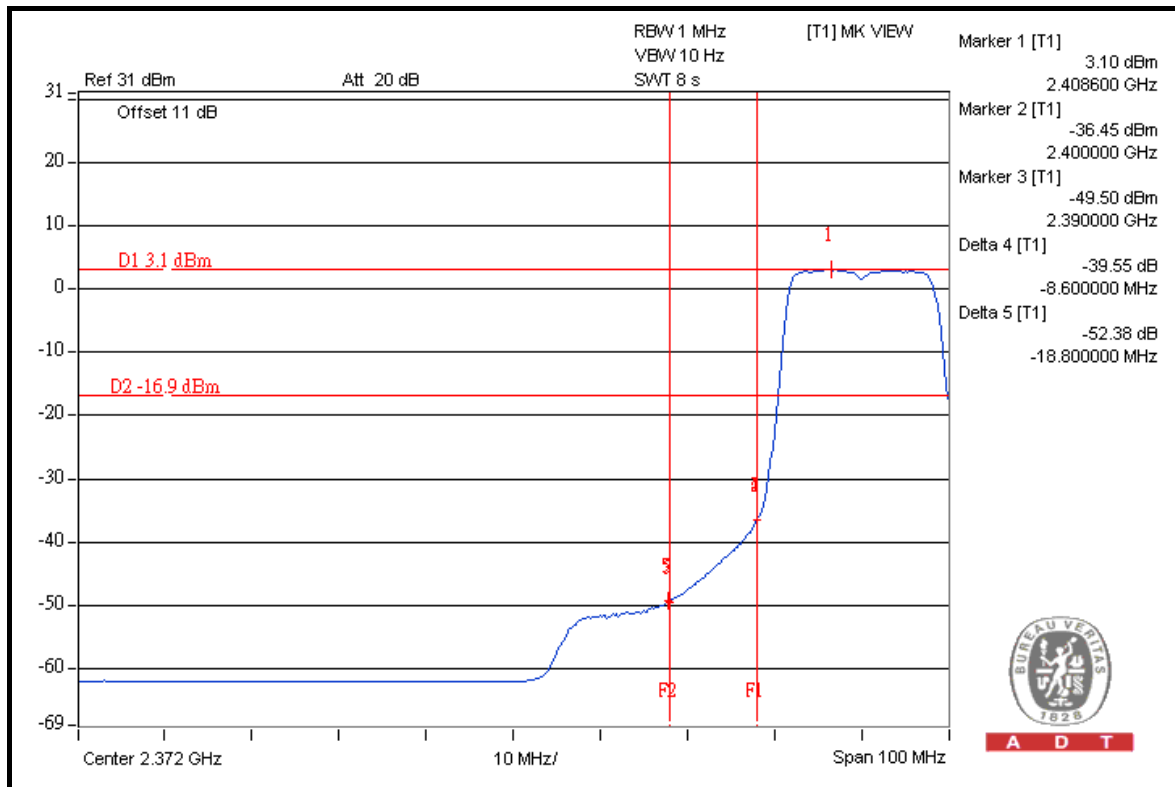
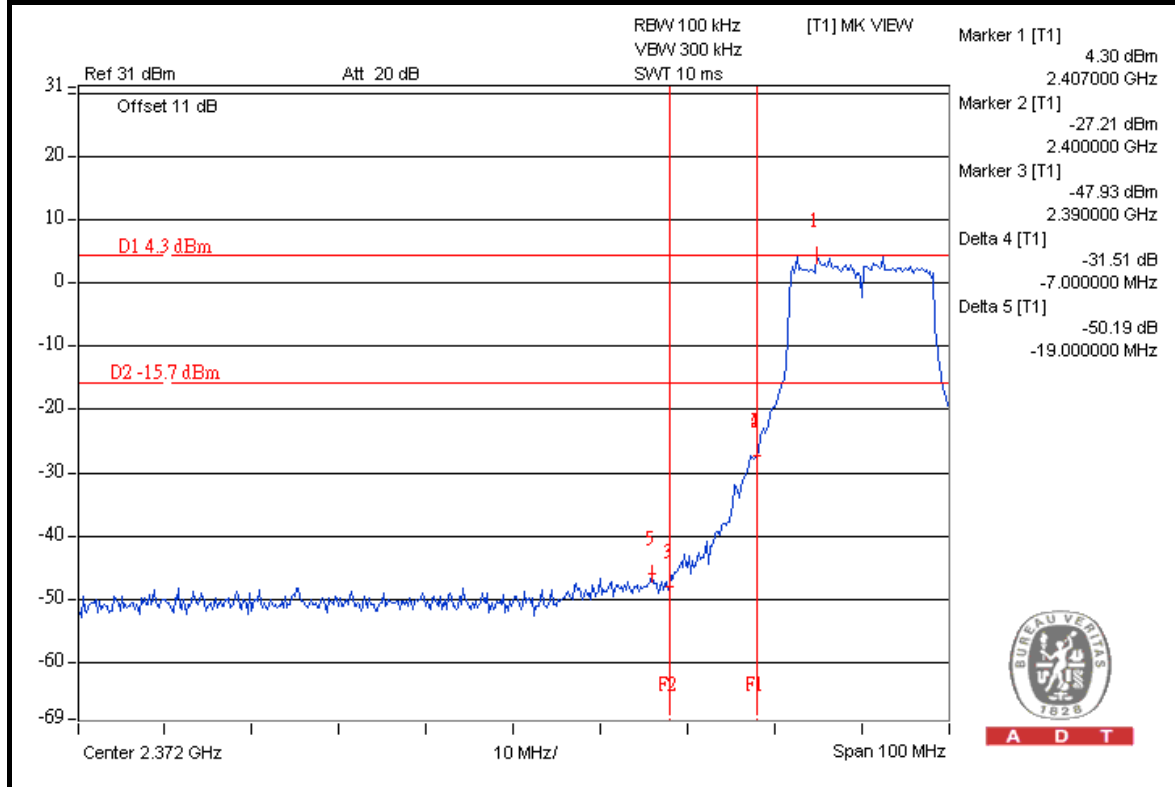
A D T



A D T

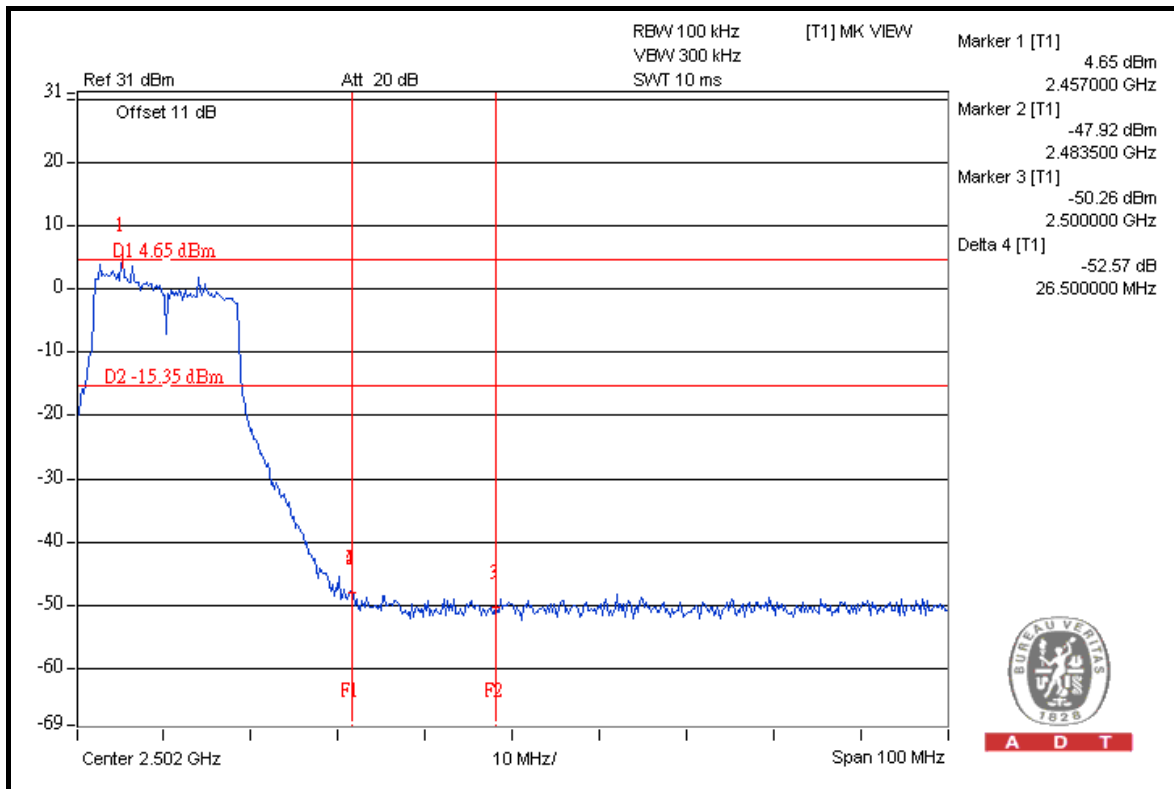
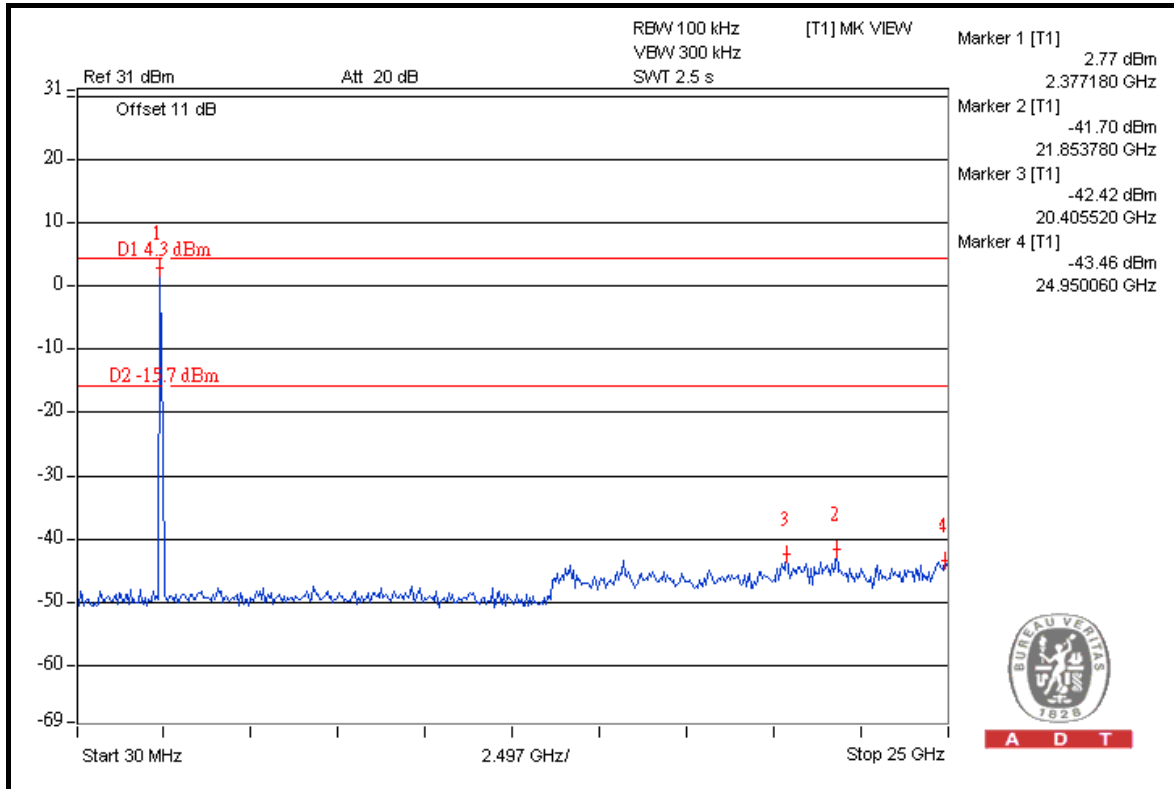
FOR CONDUCTED MEASURED

CHAIN 0



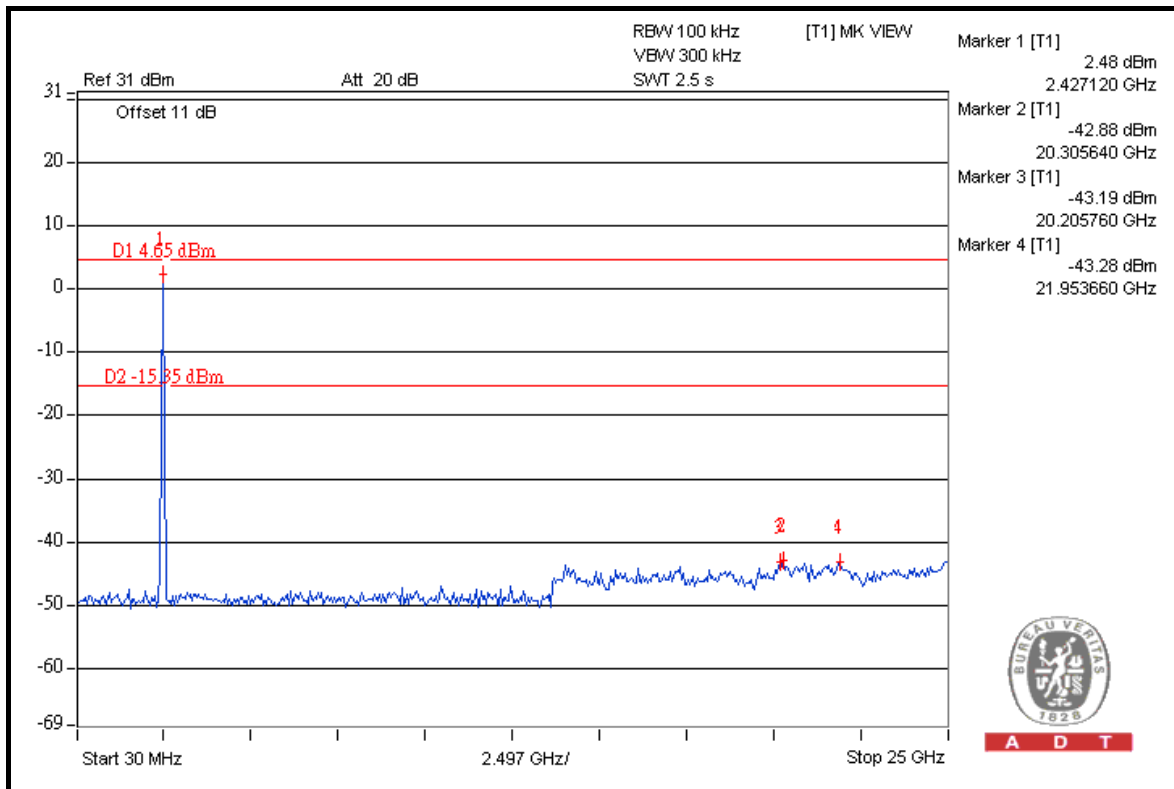
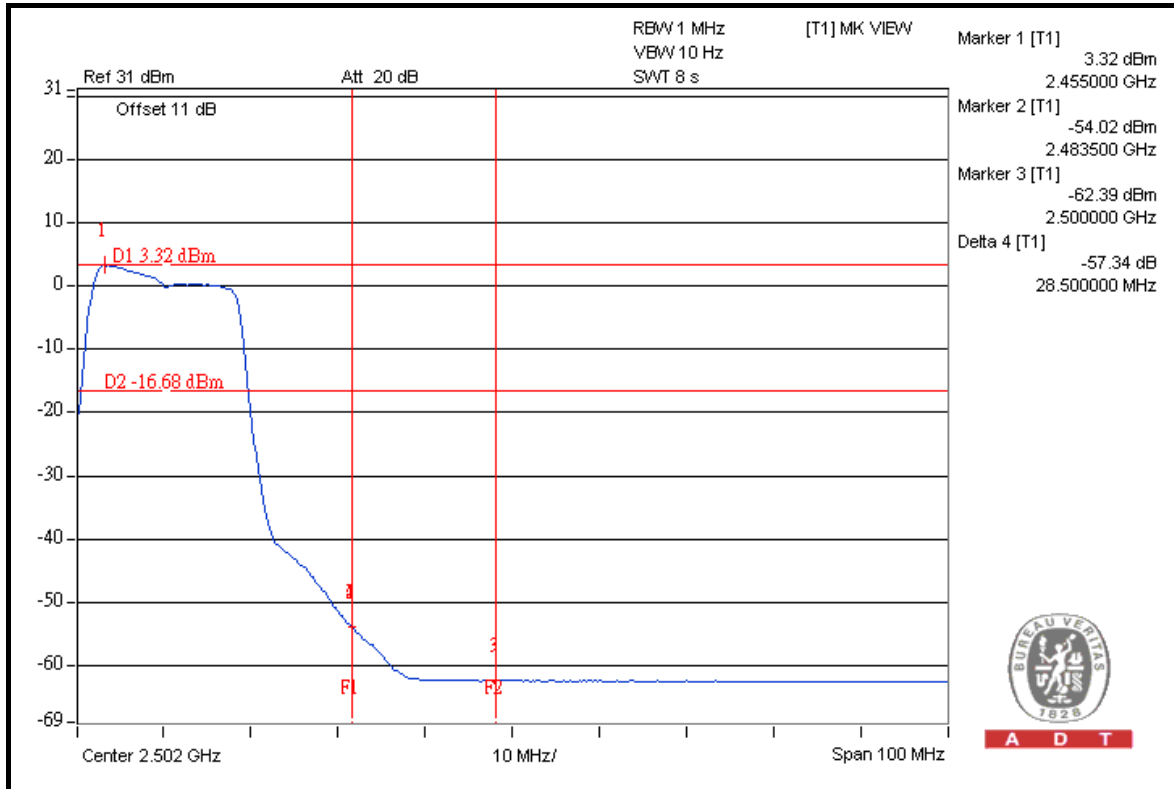


A D T





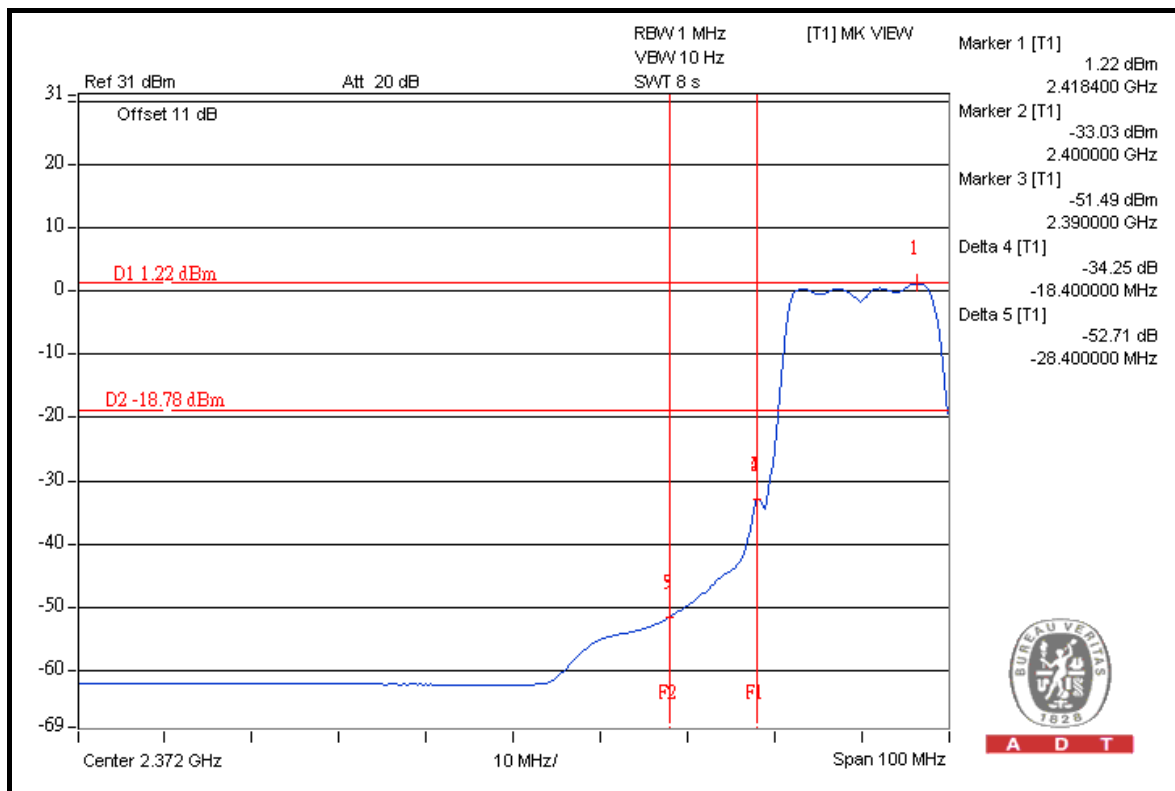
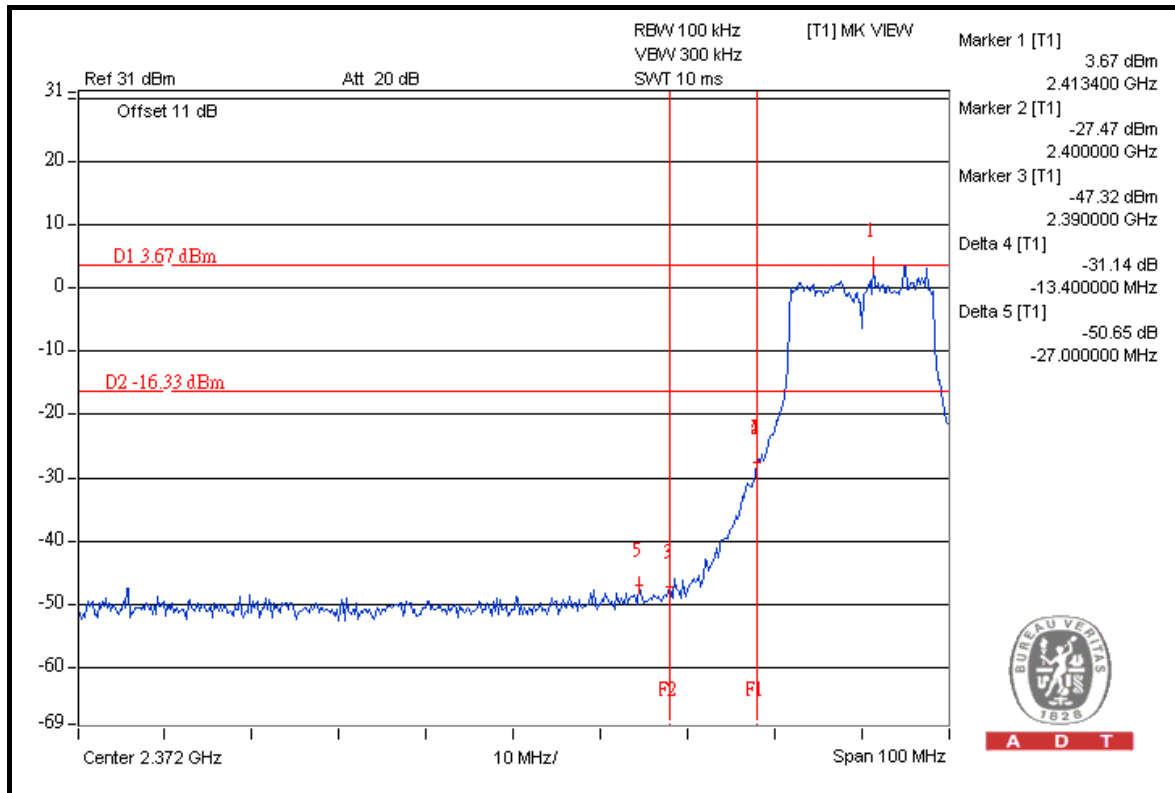
A D T





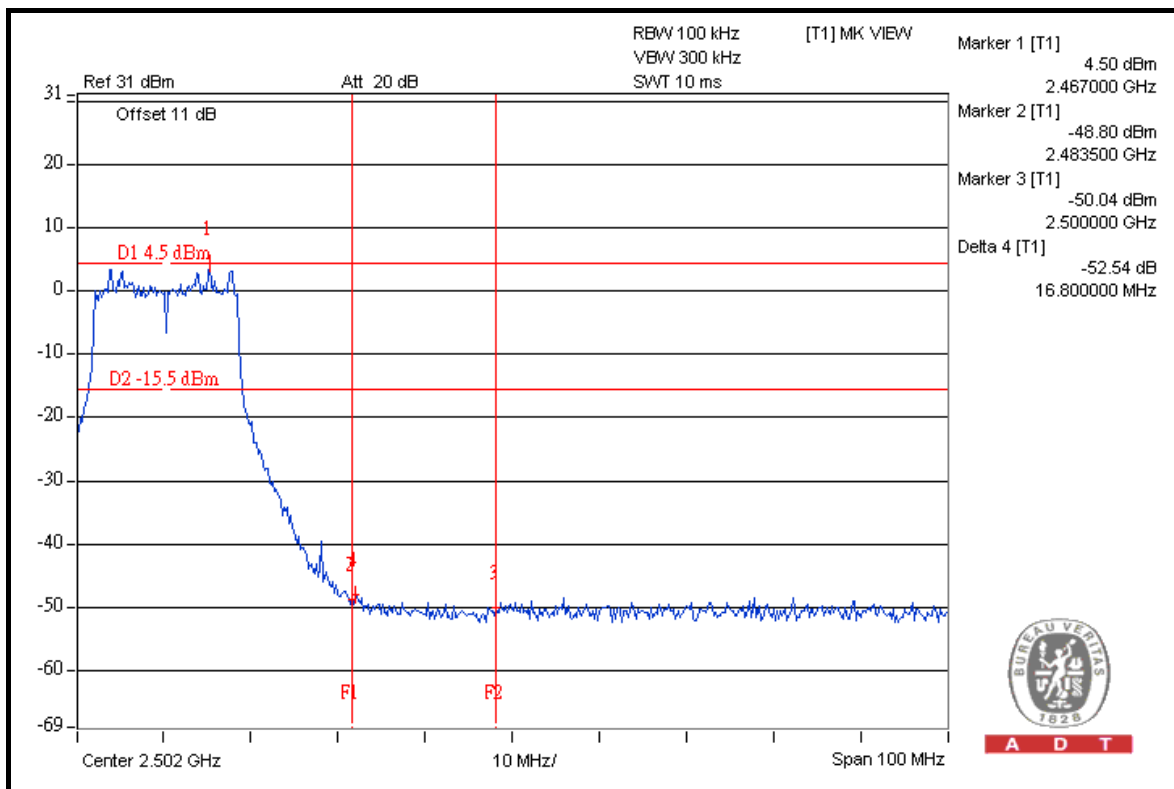
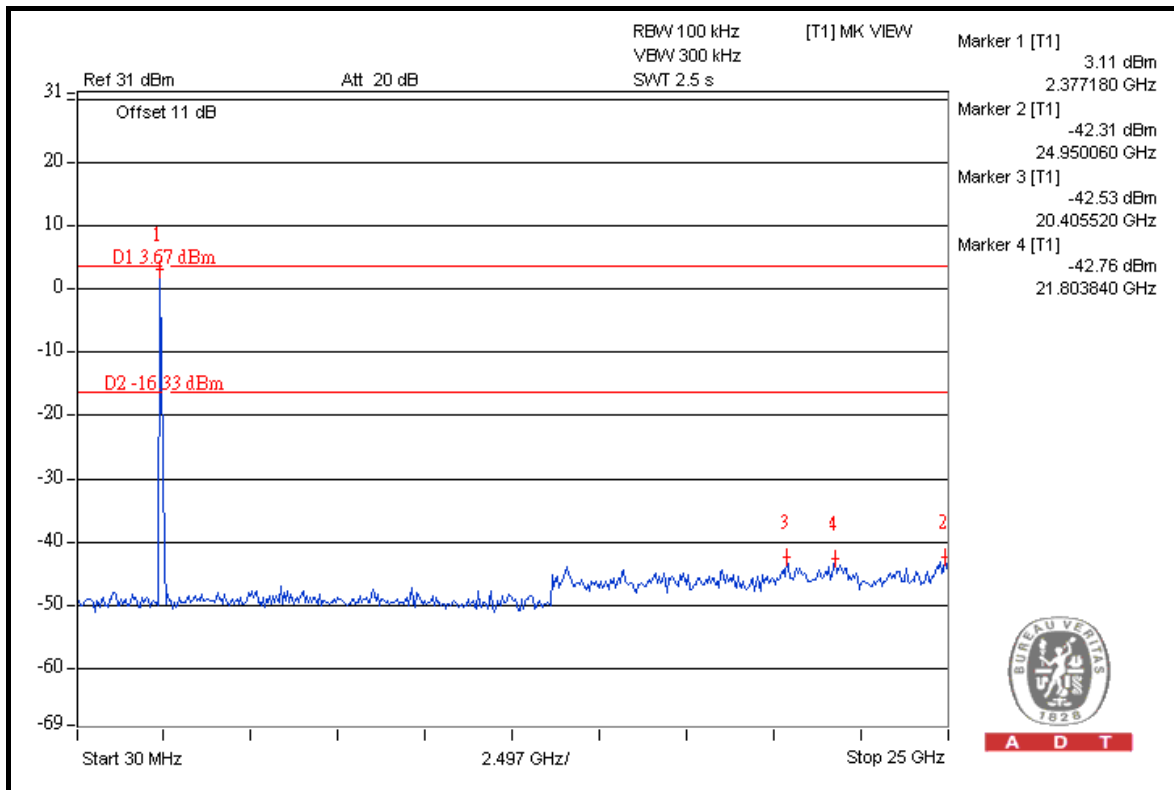
A D T

CHAIN 1



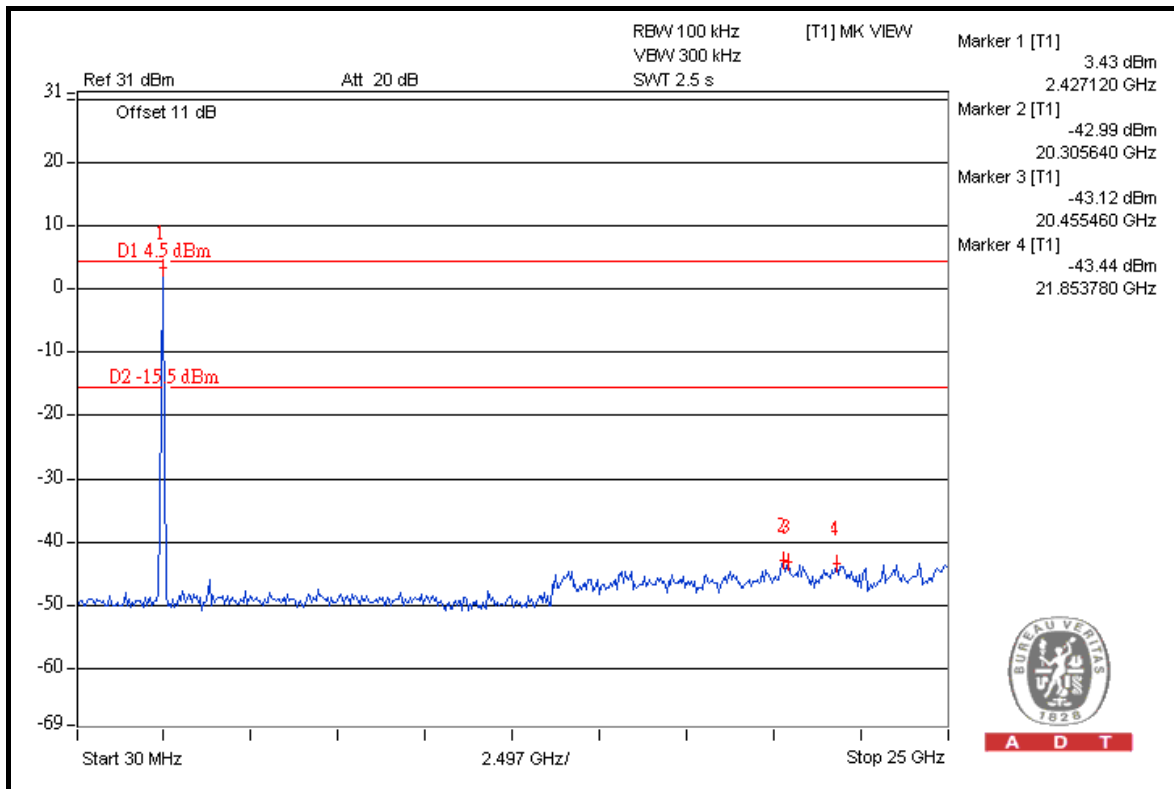
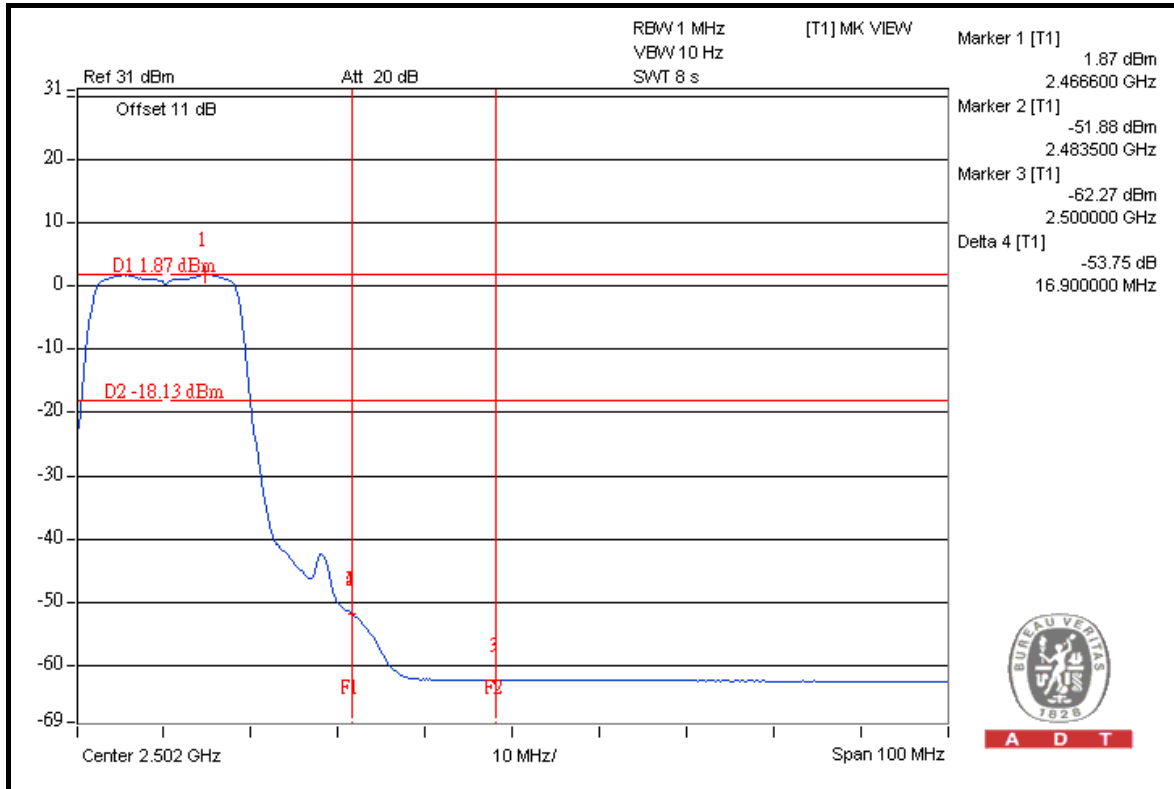


A D T





A D T





A D T

802.11n (20MHz)

RESTRICT BAND (2310 ~ 2390 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	108.3	41.71	66.59	74.00
2412.00 (AV)	97.1	47.22	49.88	54.00

RESTRICT BAND (2483.5 ~ 2500 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	109.3	43.25	66.05	74.00
2462.00 (AV)	98.5	50.27	48.23	54.00

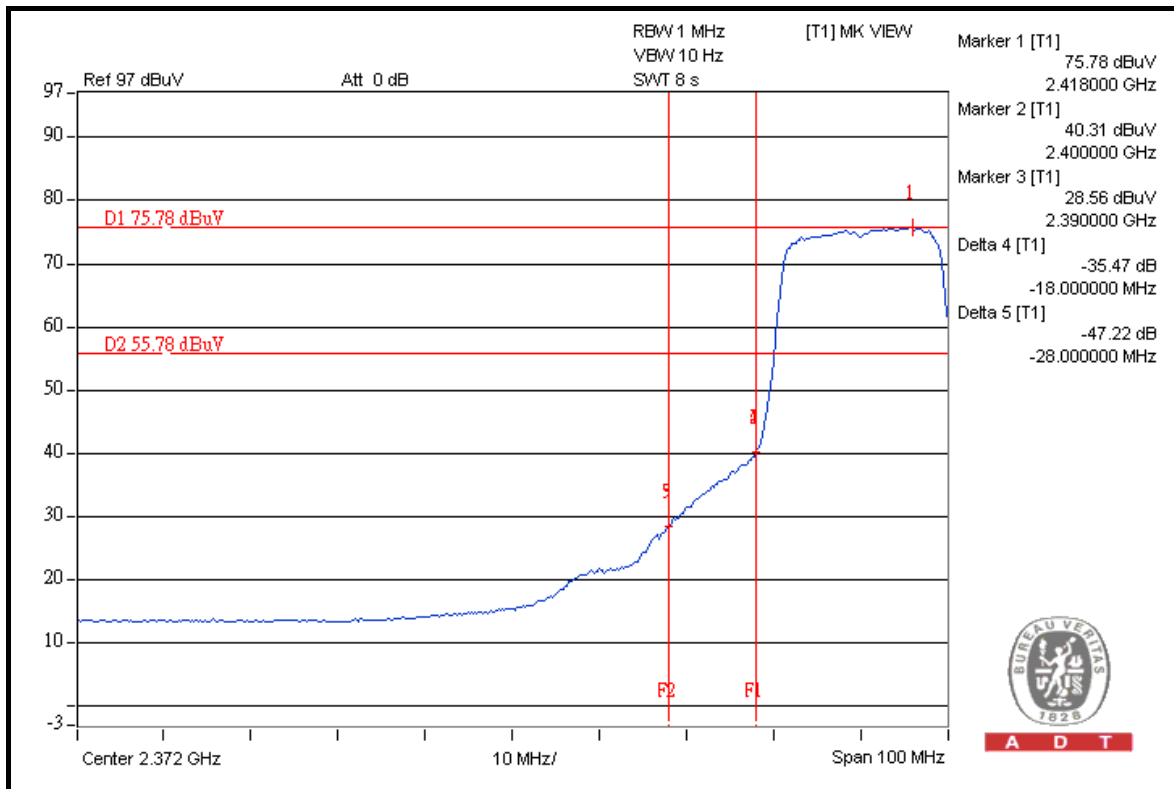
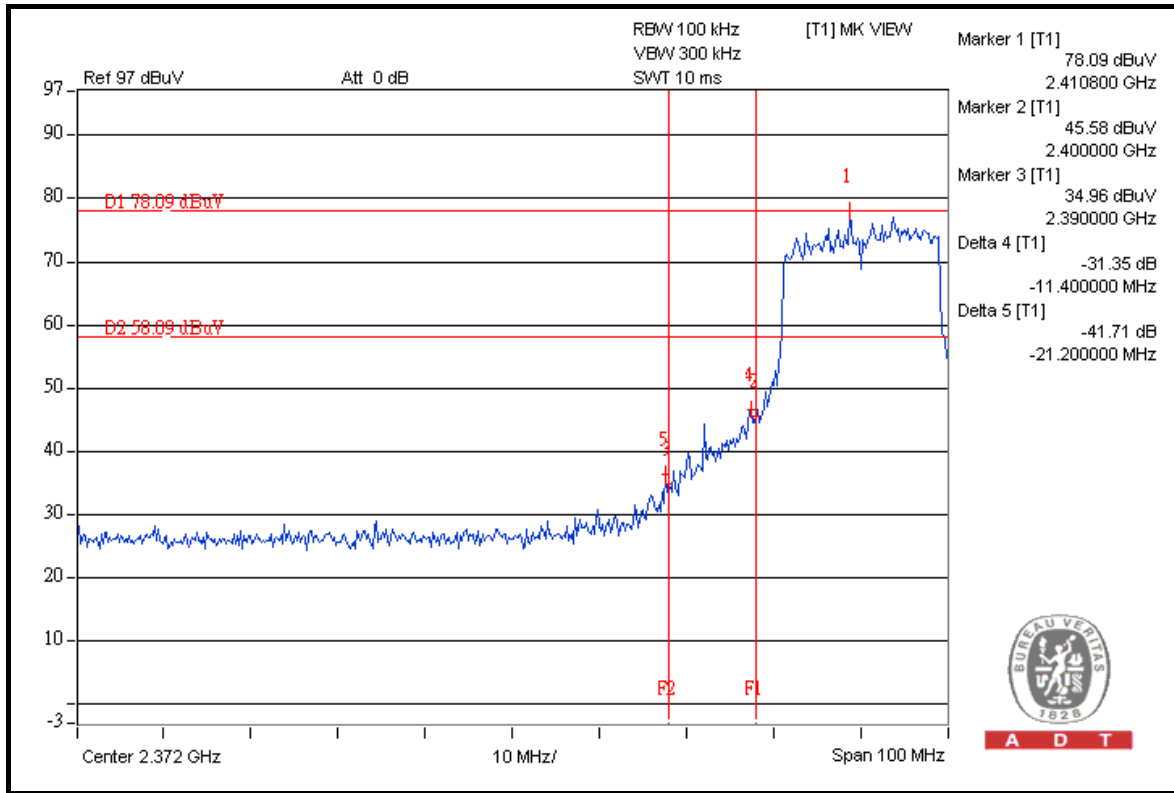
NOTE:

1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.



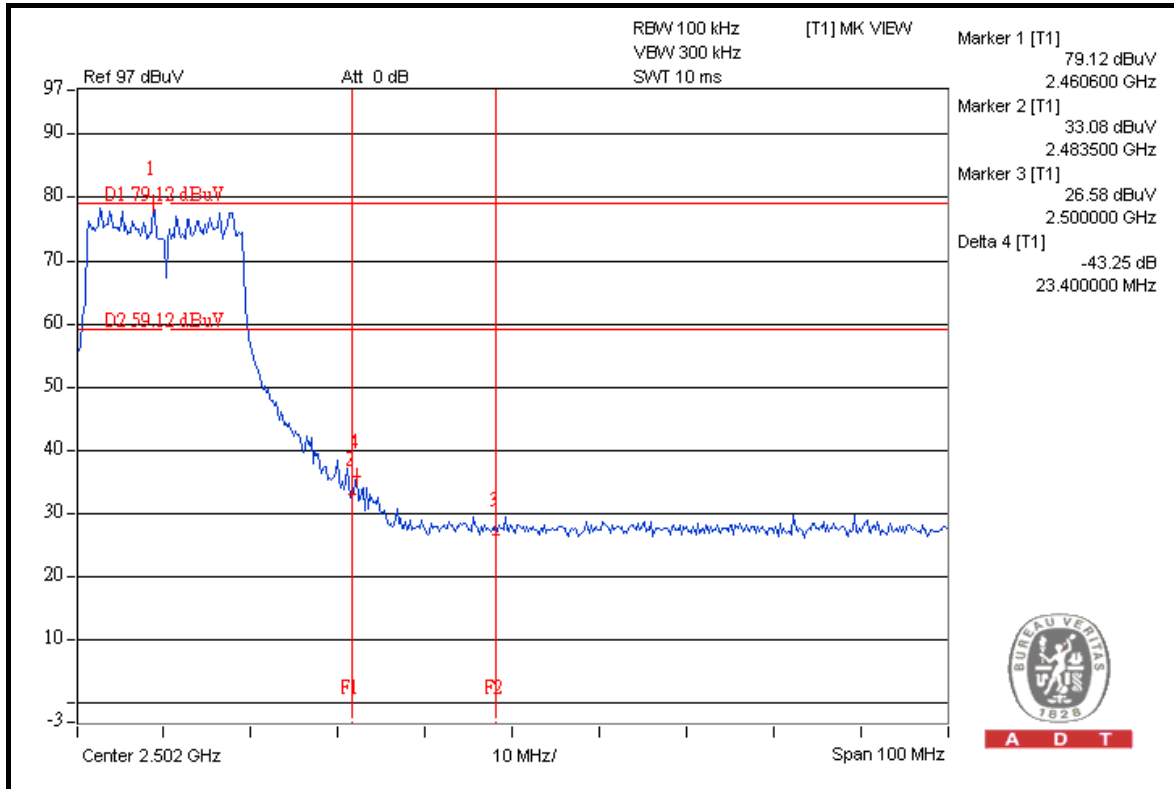
A D T

FOR RADIATED MEASURED (BOTH CHAINS ON)

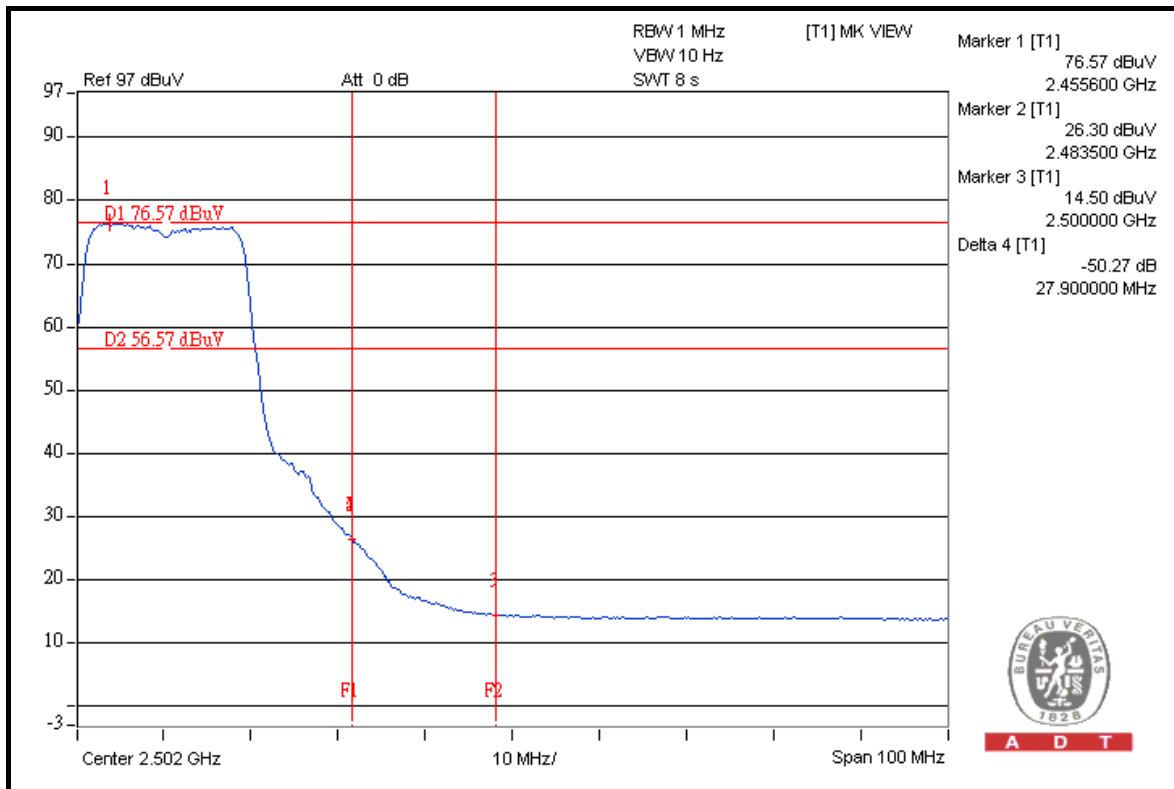




A D T



A D T



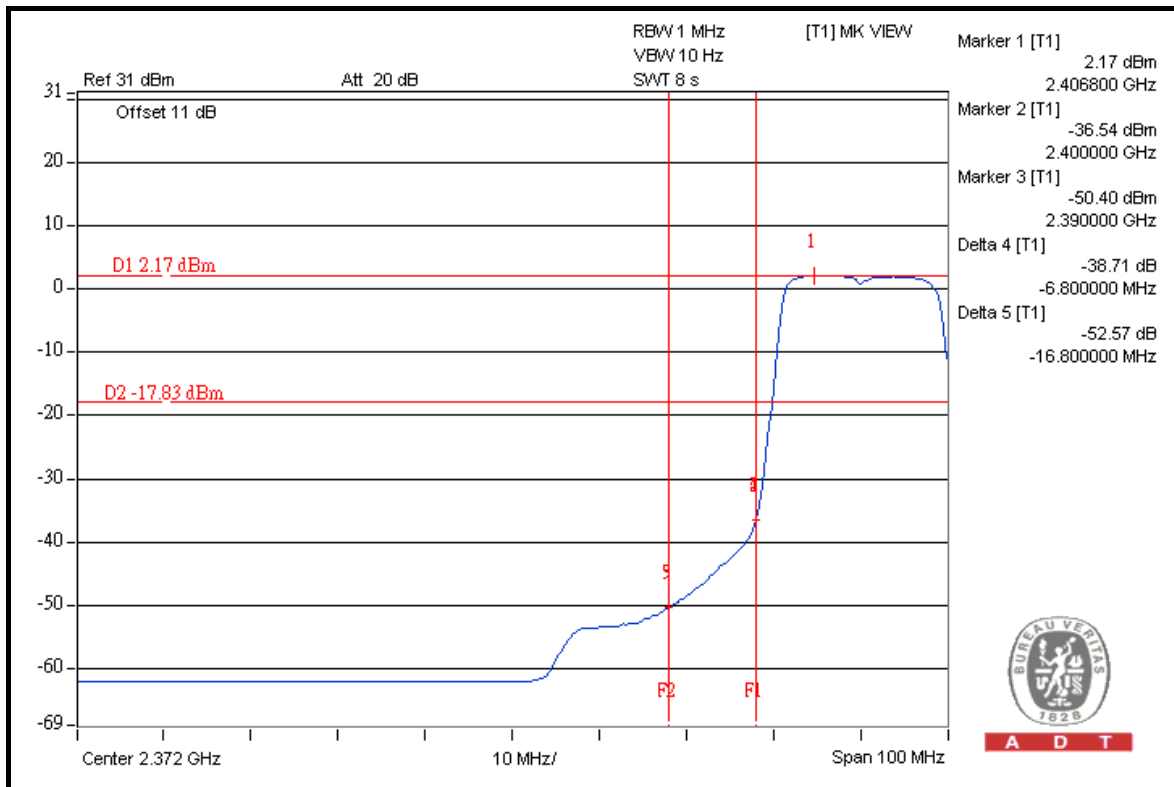
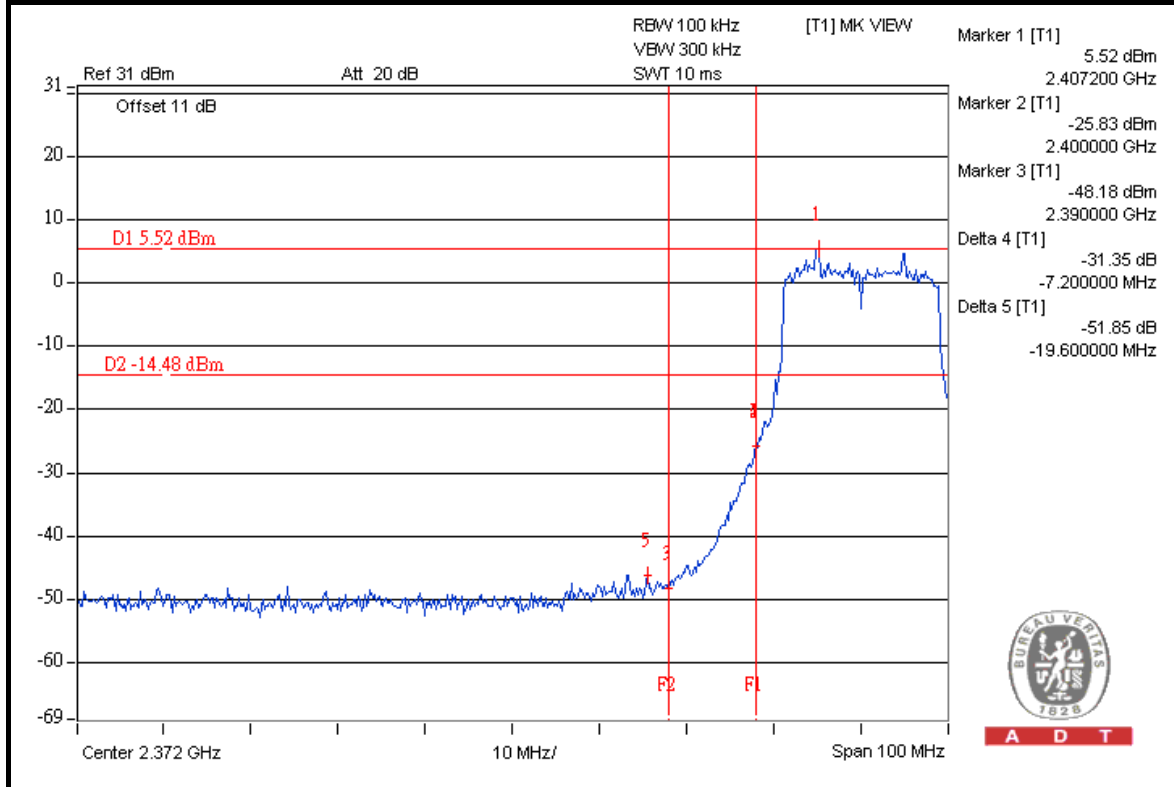
A D T



A D T

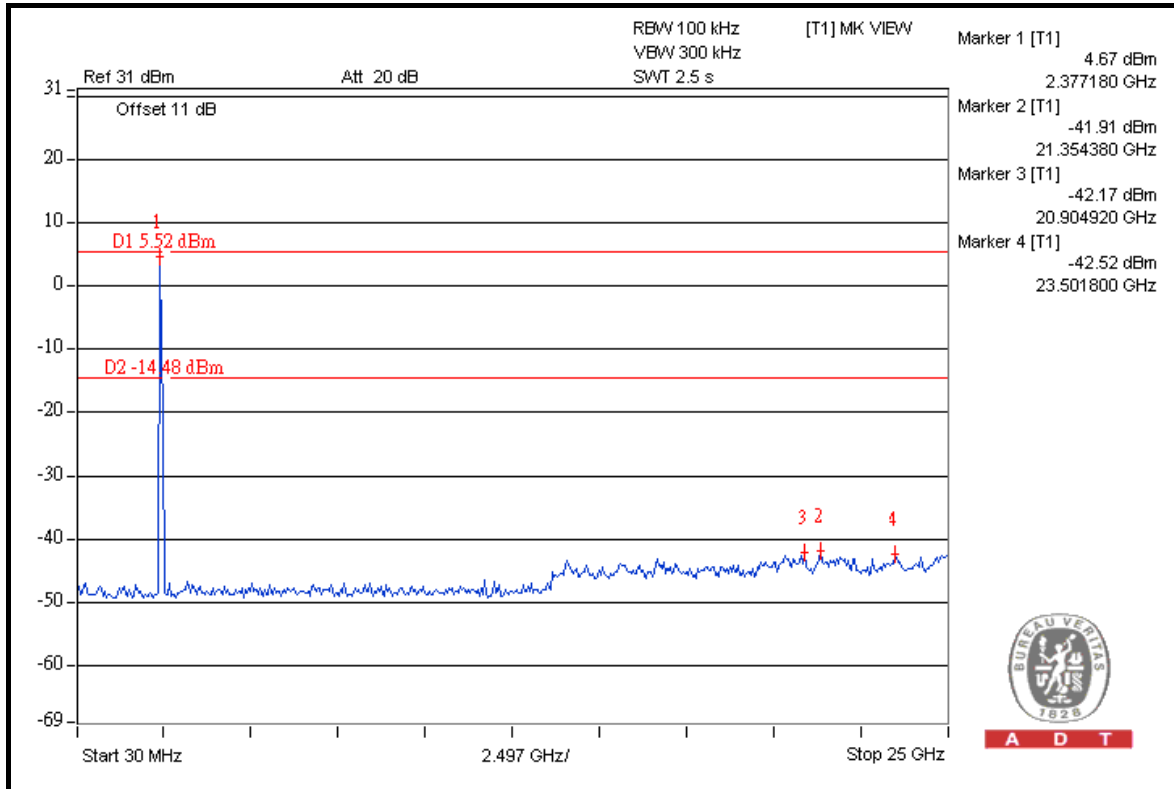
FOR CONDUCTED MEASURED

CHAIN 0

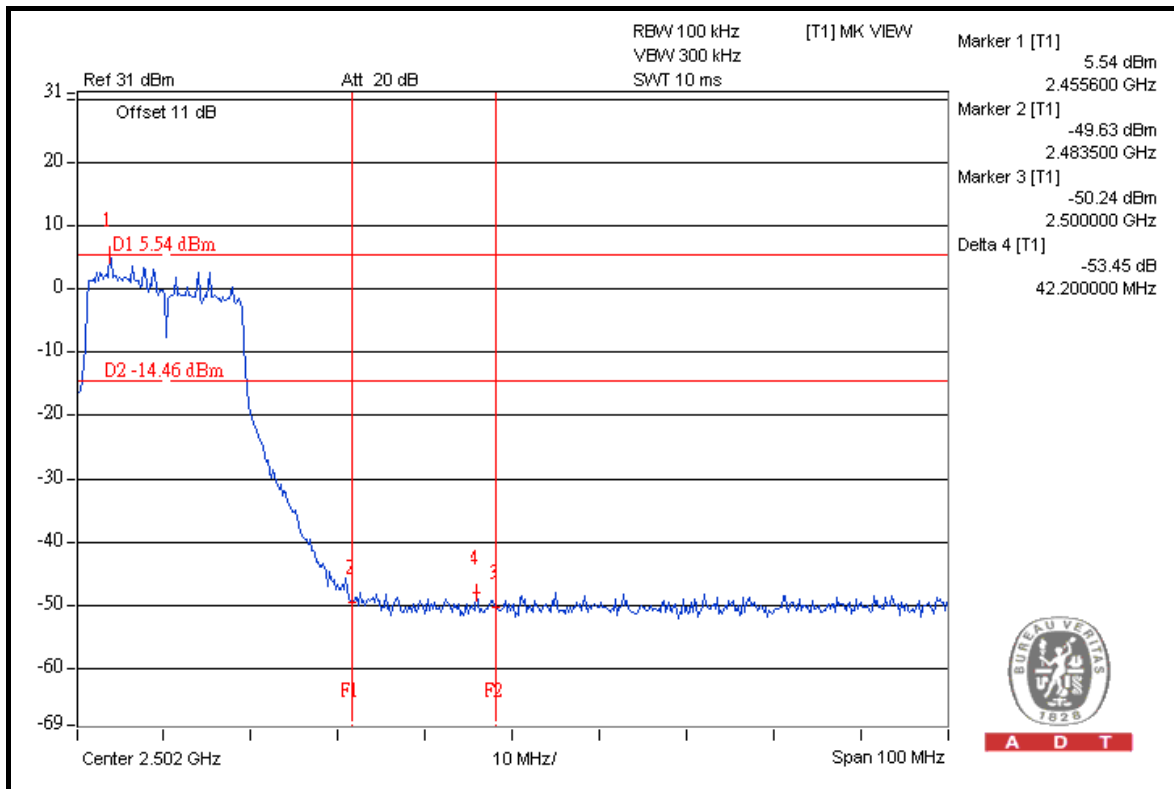




A D T



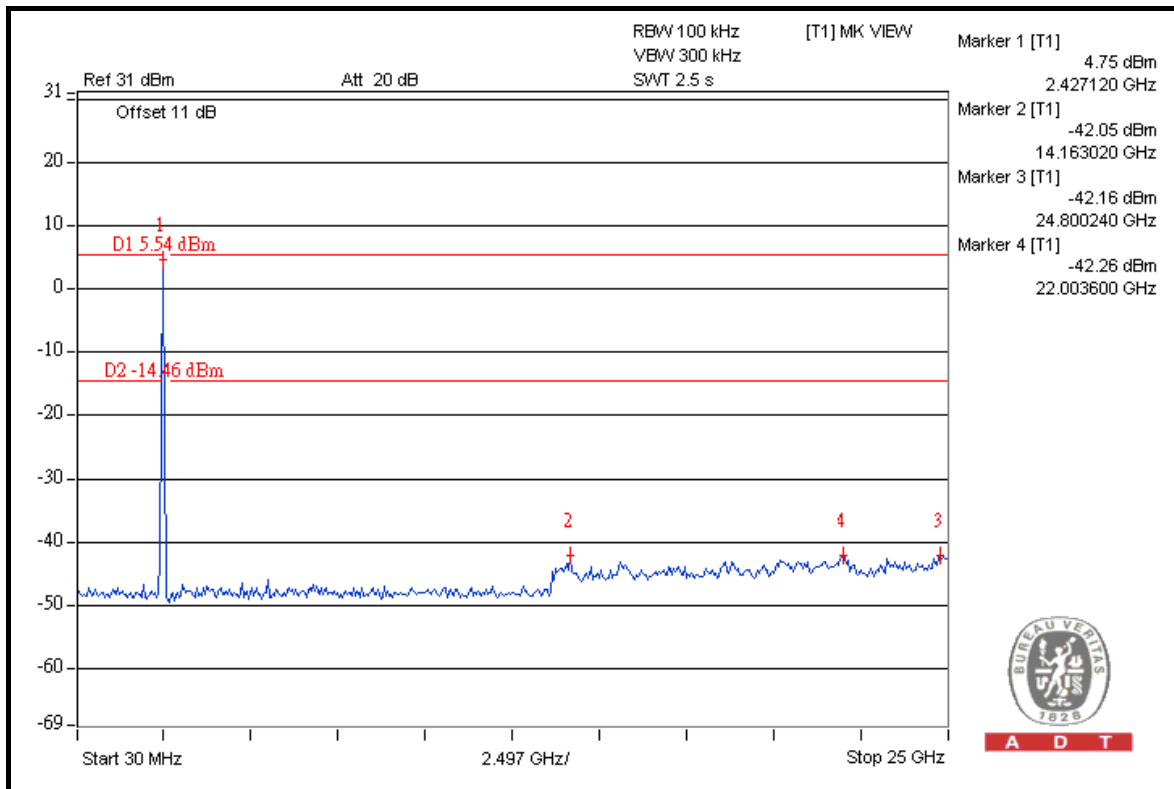
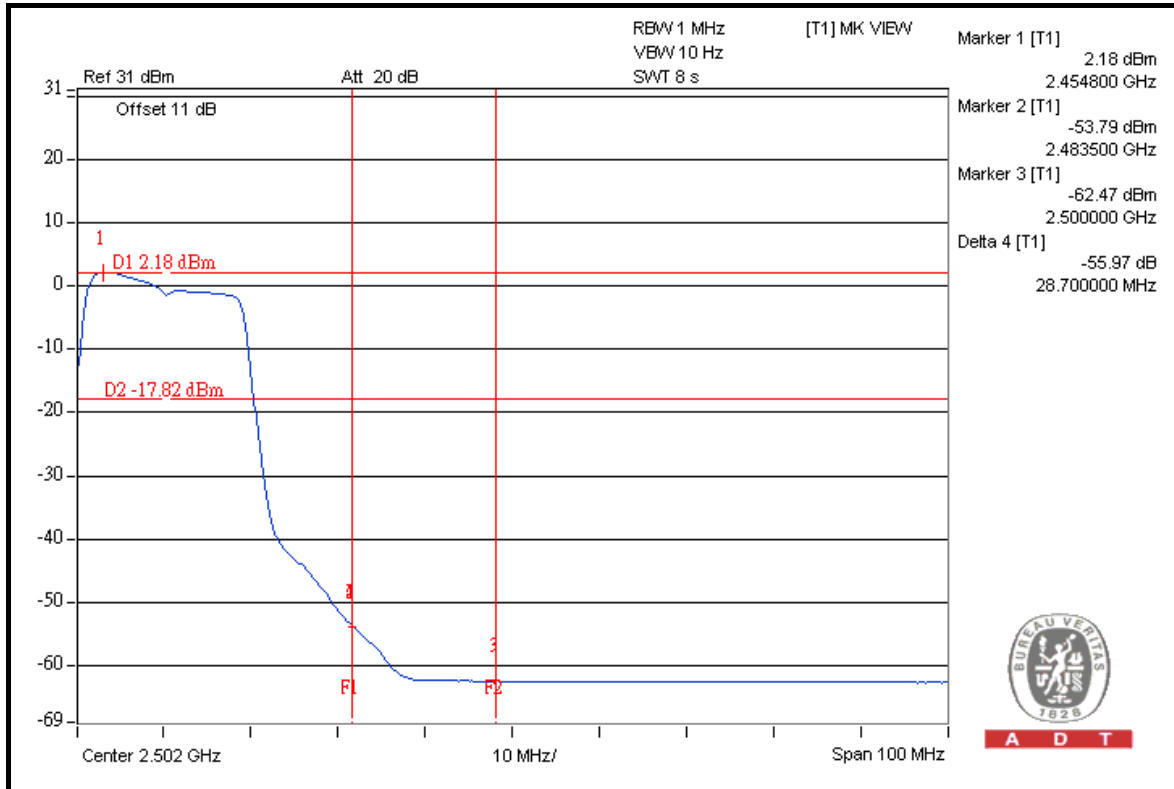
A D T



A D T



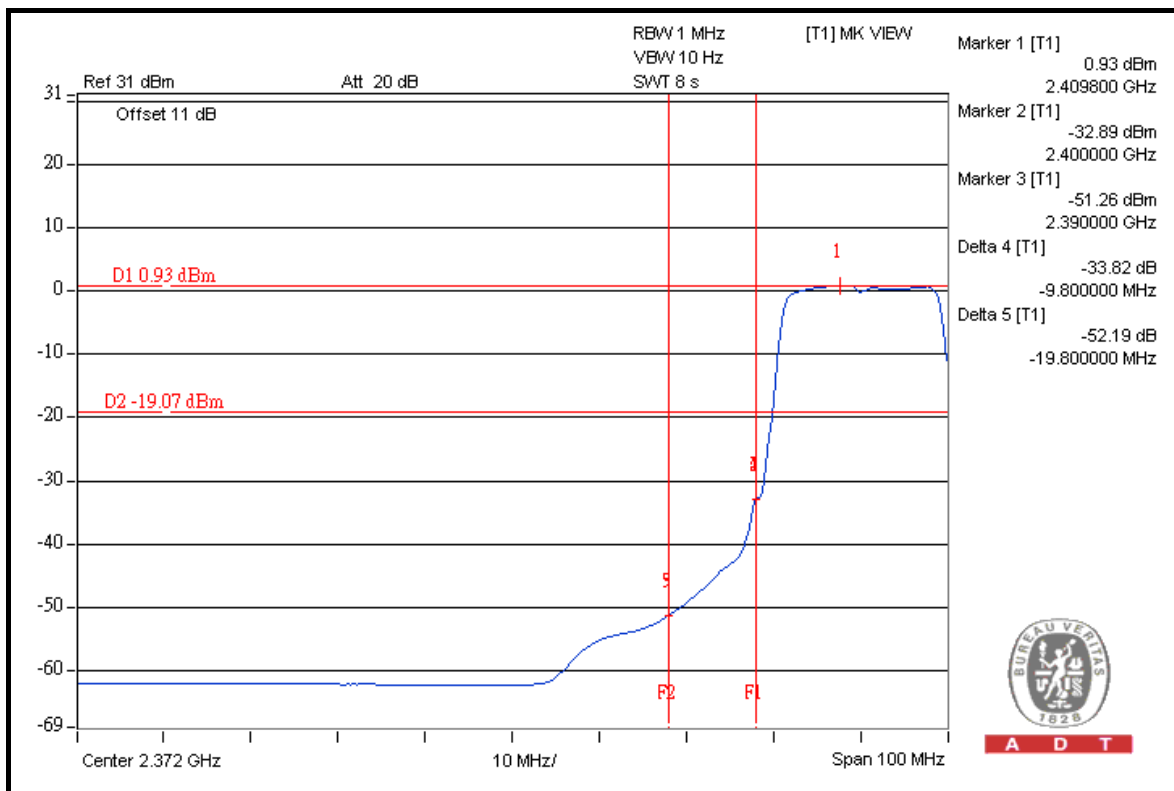
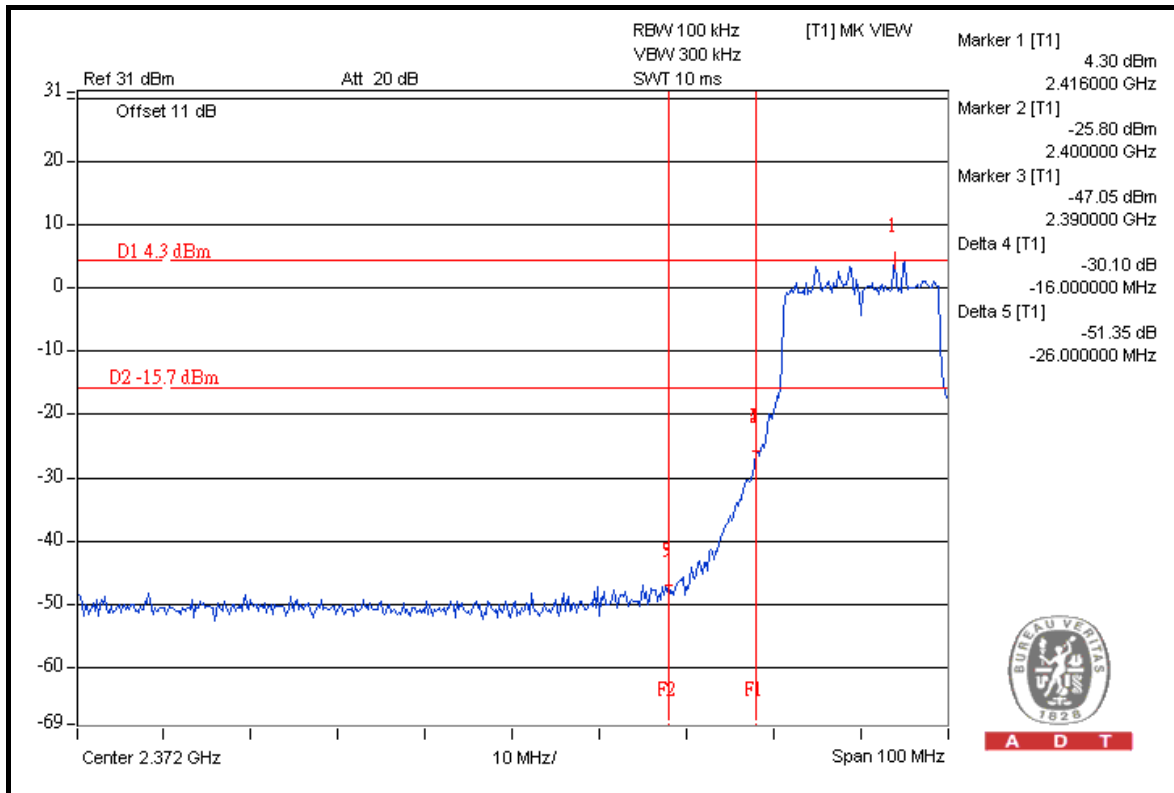
A D T





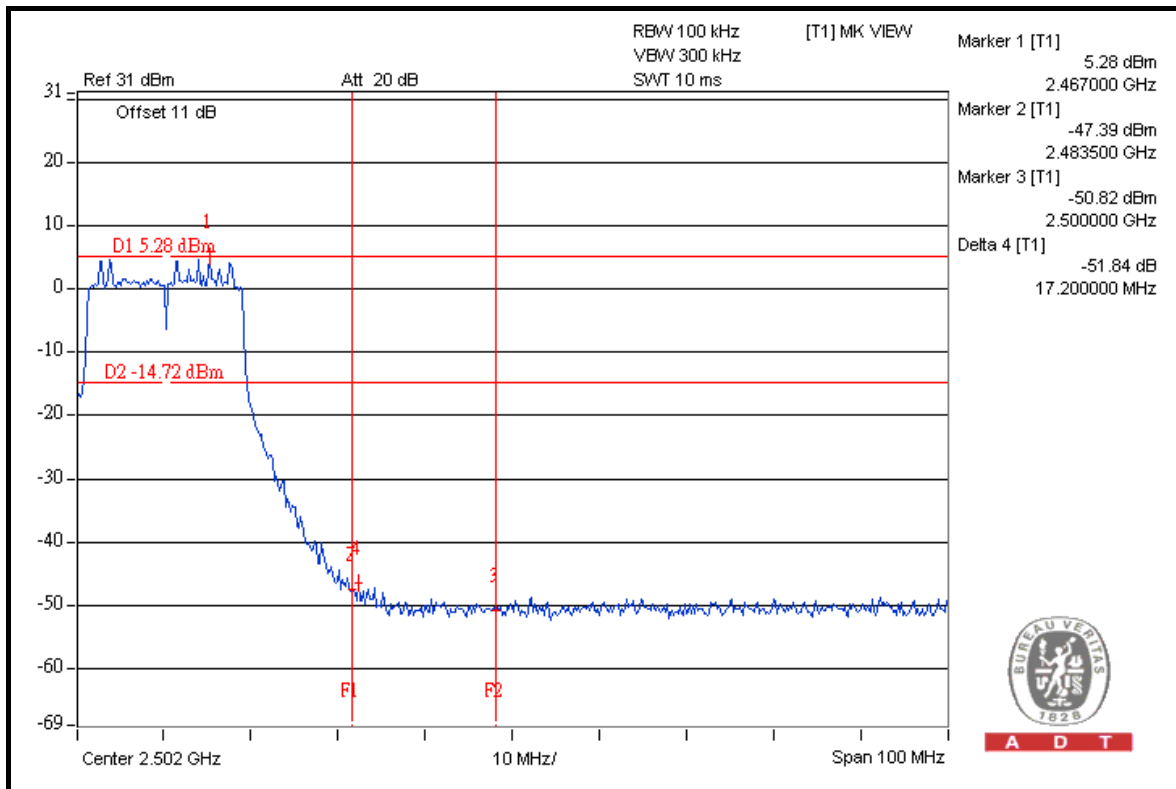
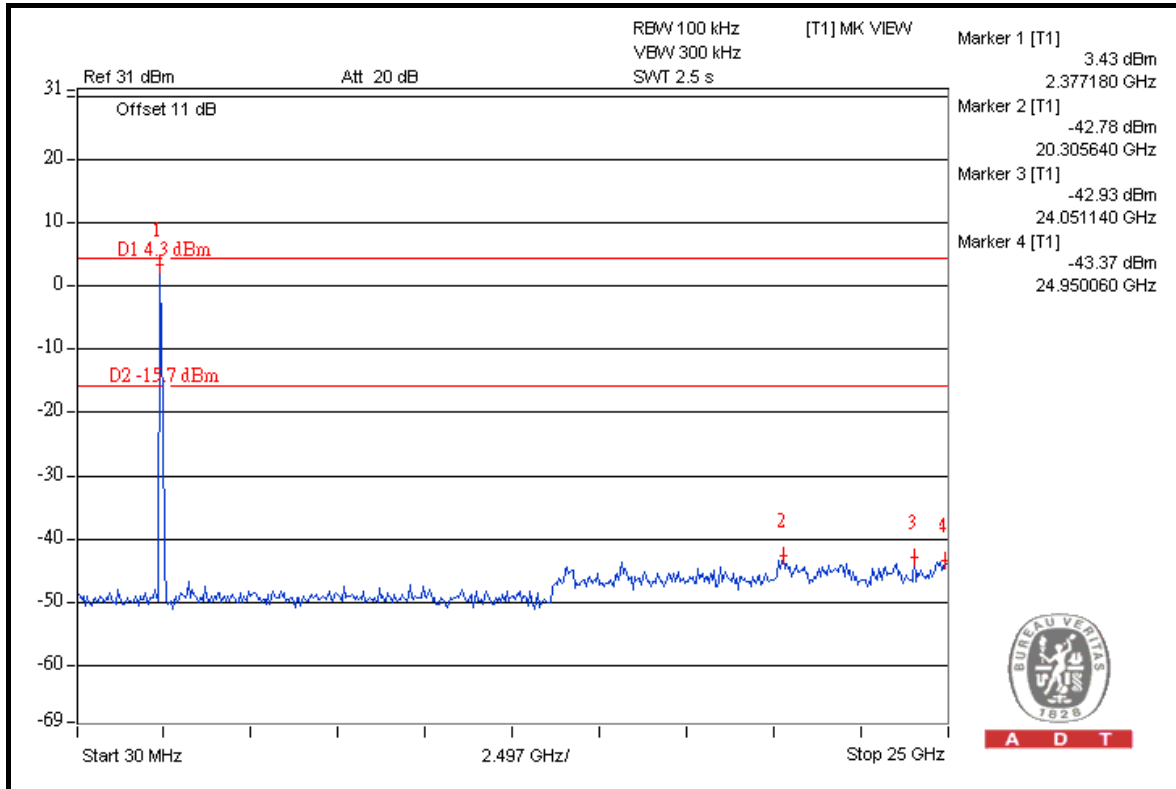
A D T

CHAIN 1



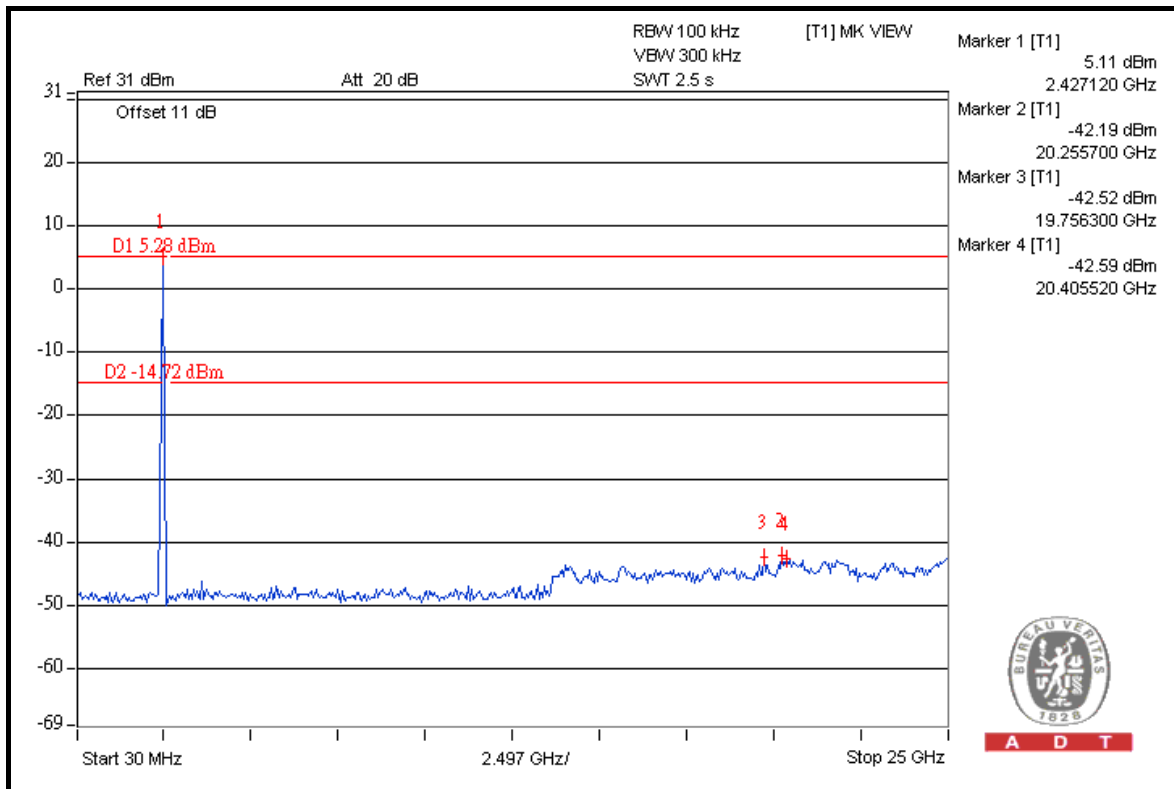
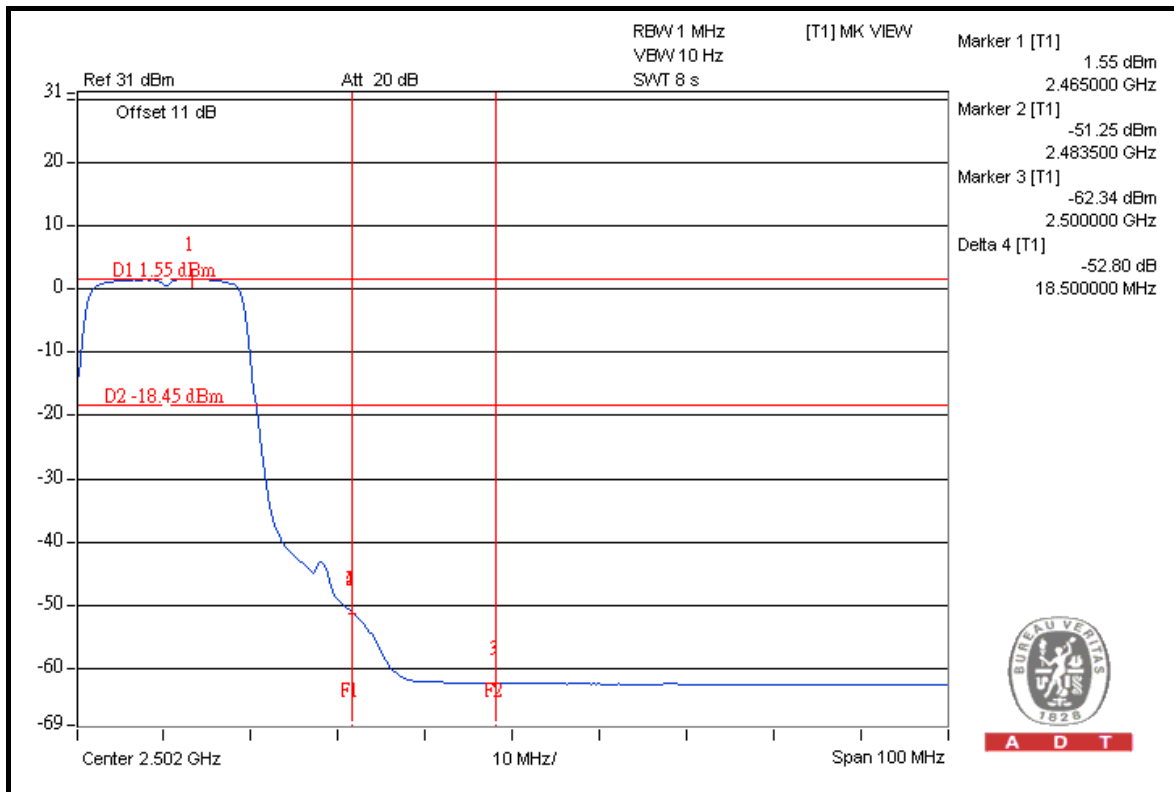


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802.11n (40MHz)

RESTRICT BAND (2310 ~ 2390 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2422.00 (PK)	106.6	37.65	68.95	74.00
2422.00 (AV)	95.6	46.07	49.53	54.00

RESTRICT BAND (2483.5 ~ 2500 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2452.00 (PK)	106.1	37.79	68.31	74.00
2452.00 (AV)	95.0	45.68	49.32	54.00

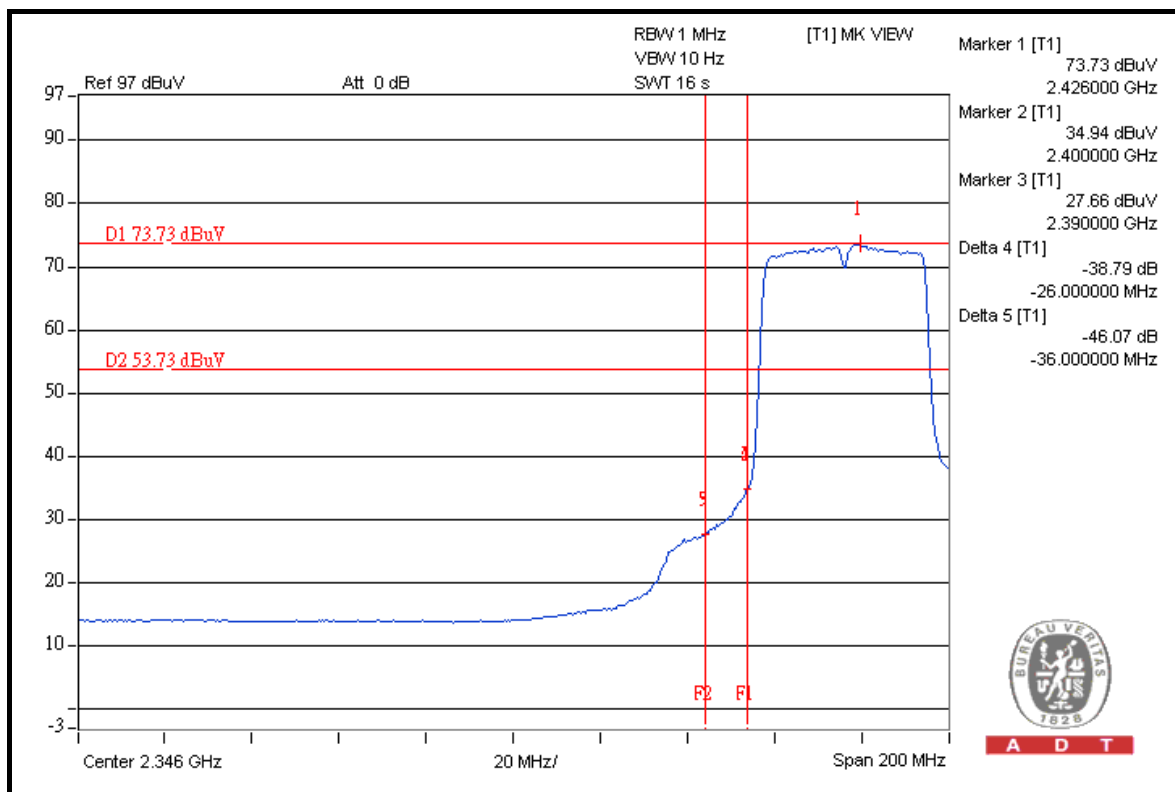
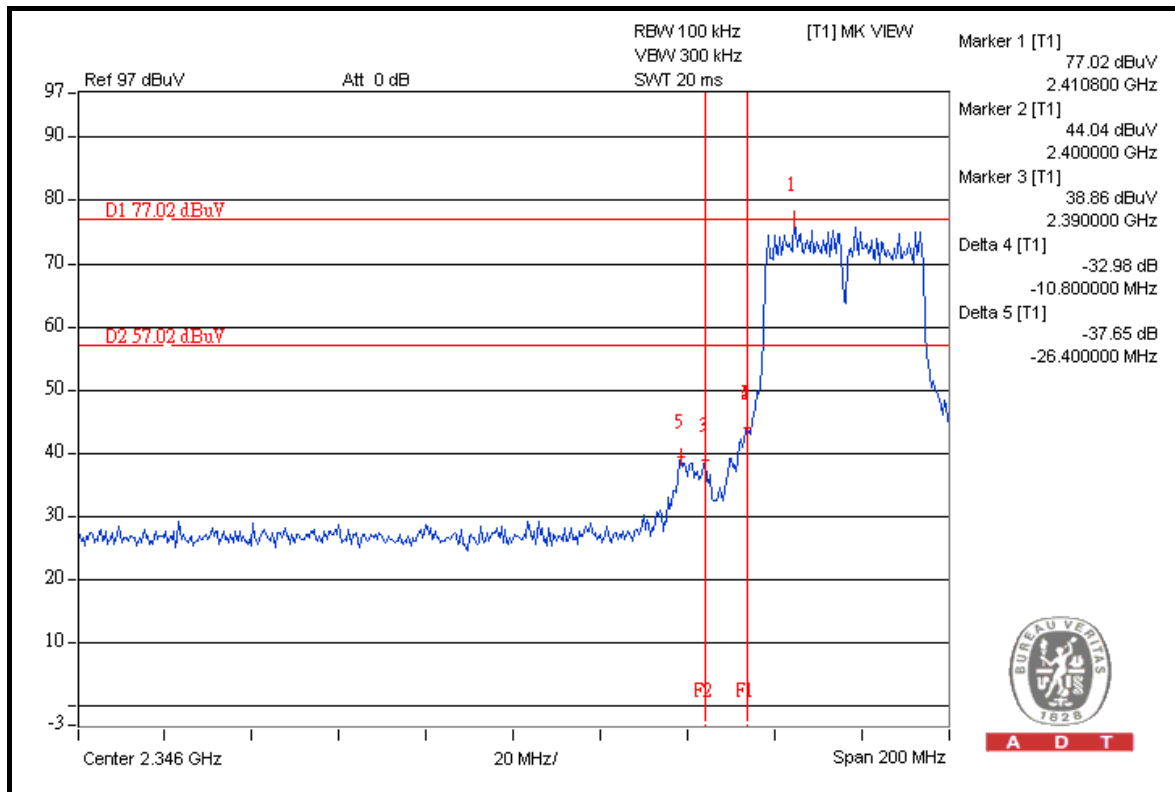
NOTE:

1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.



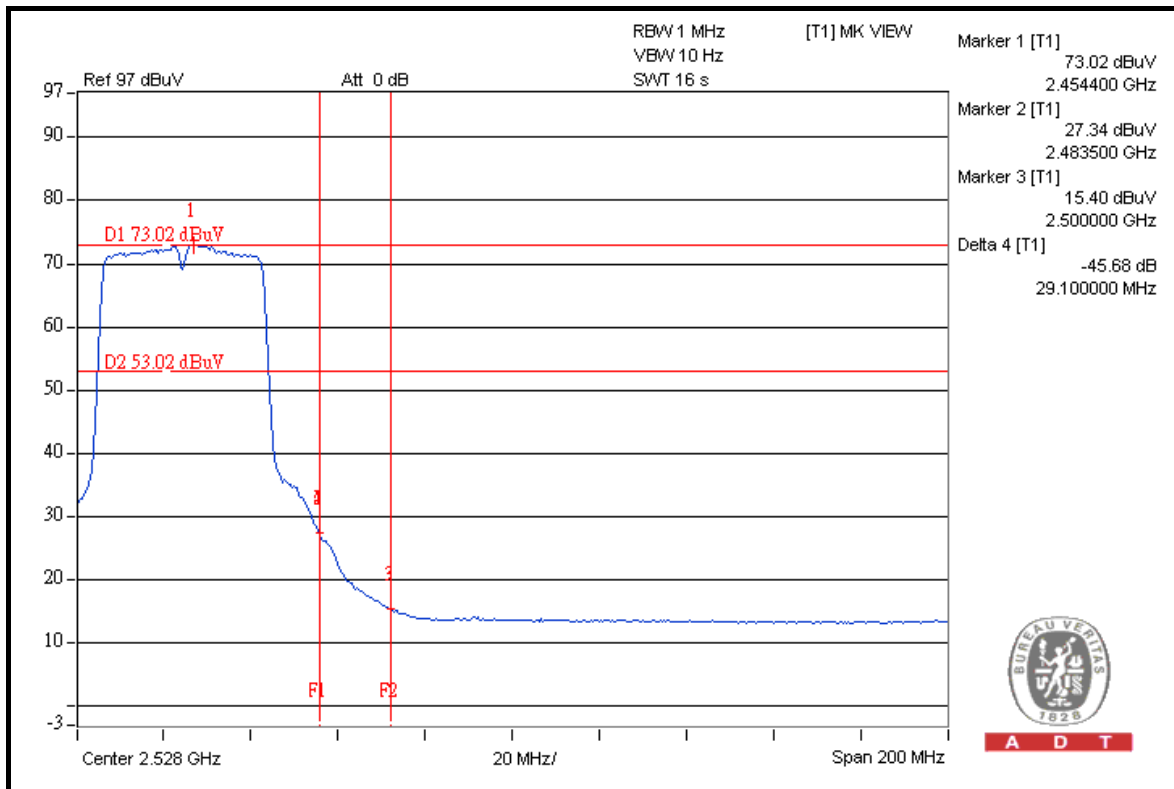
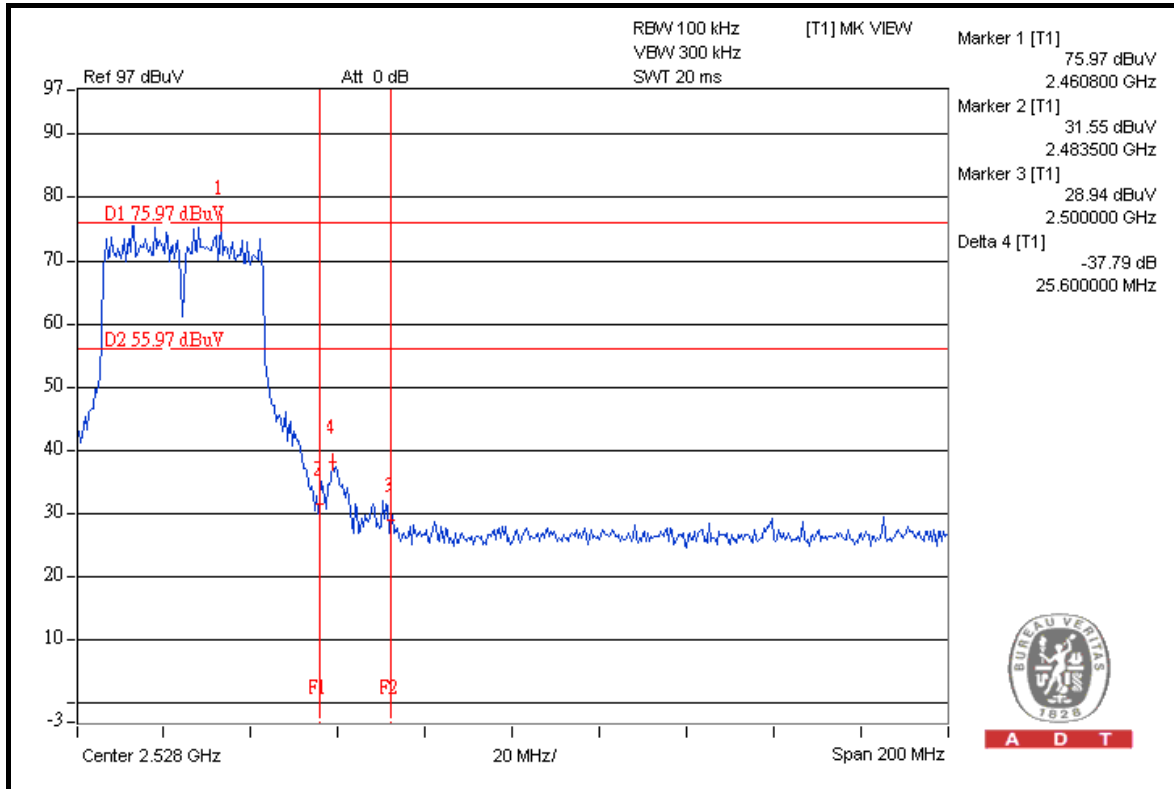
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FOR RADIATED MEASURED (BOTH CHAINS ON)





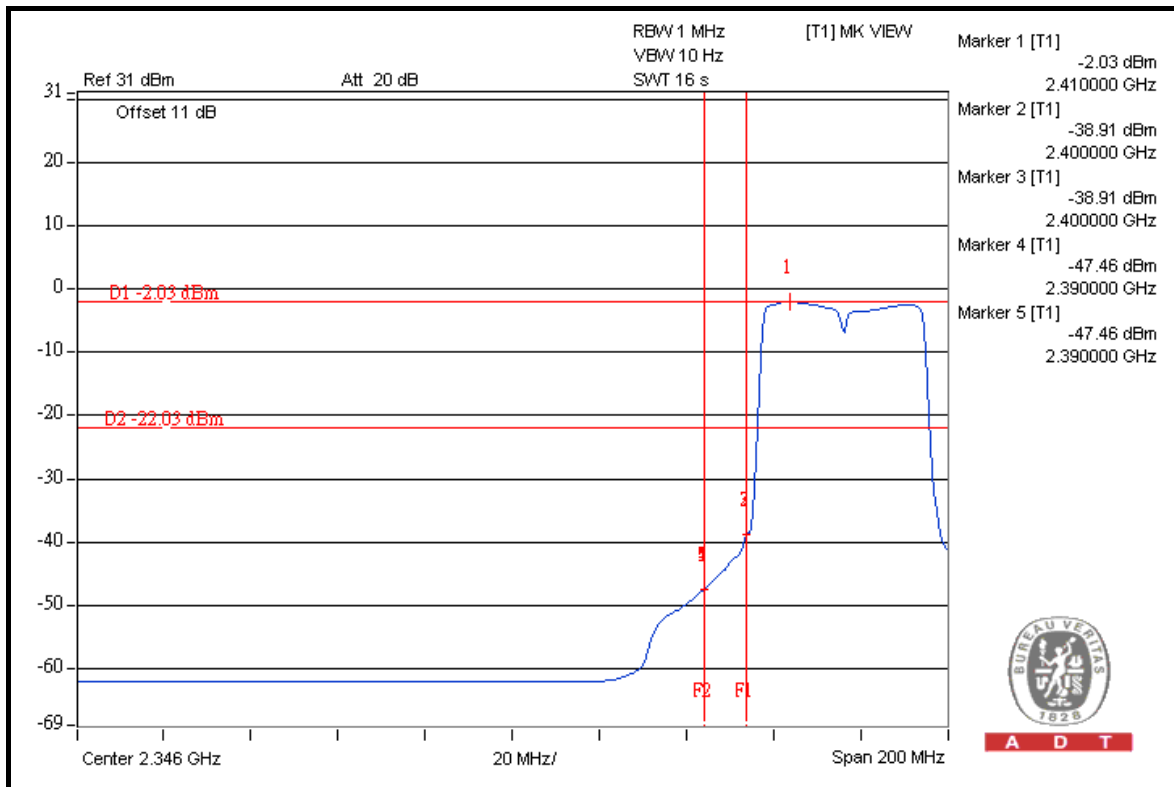
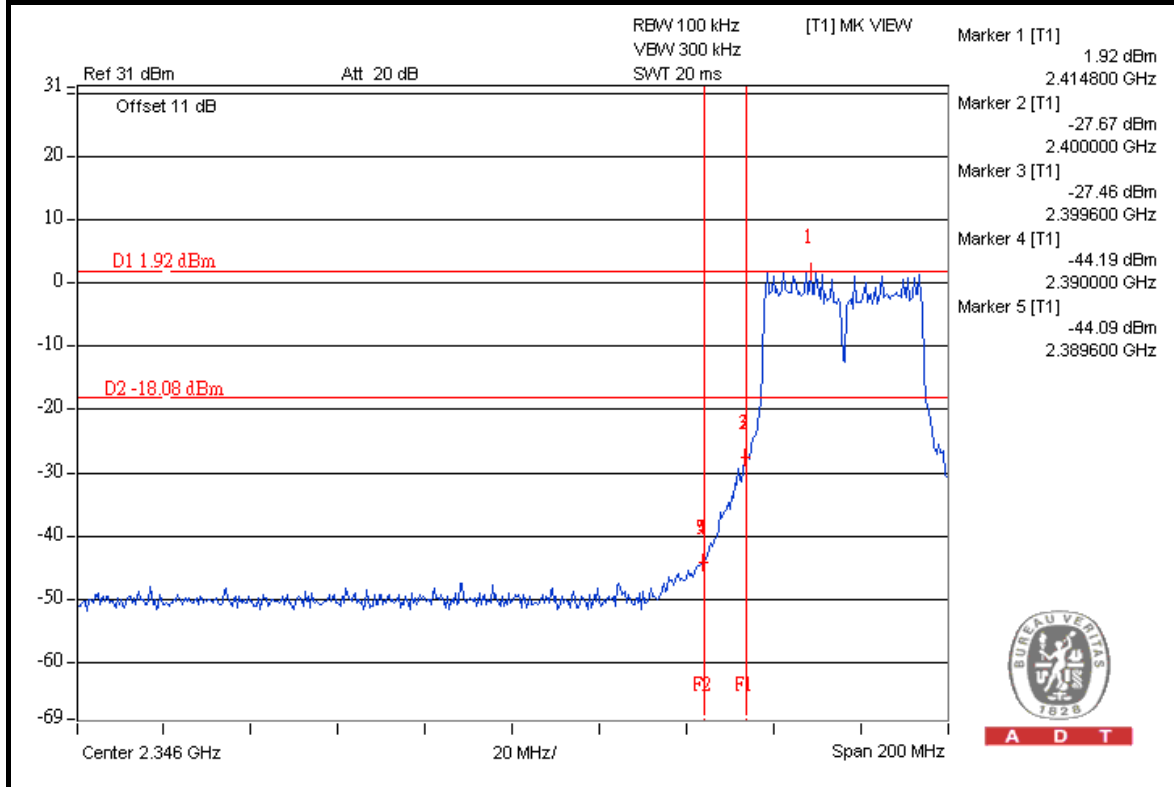
A D T





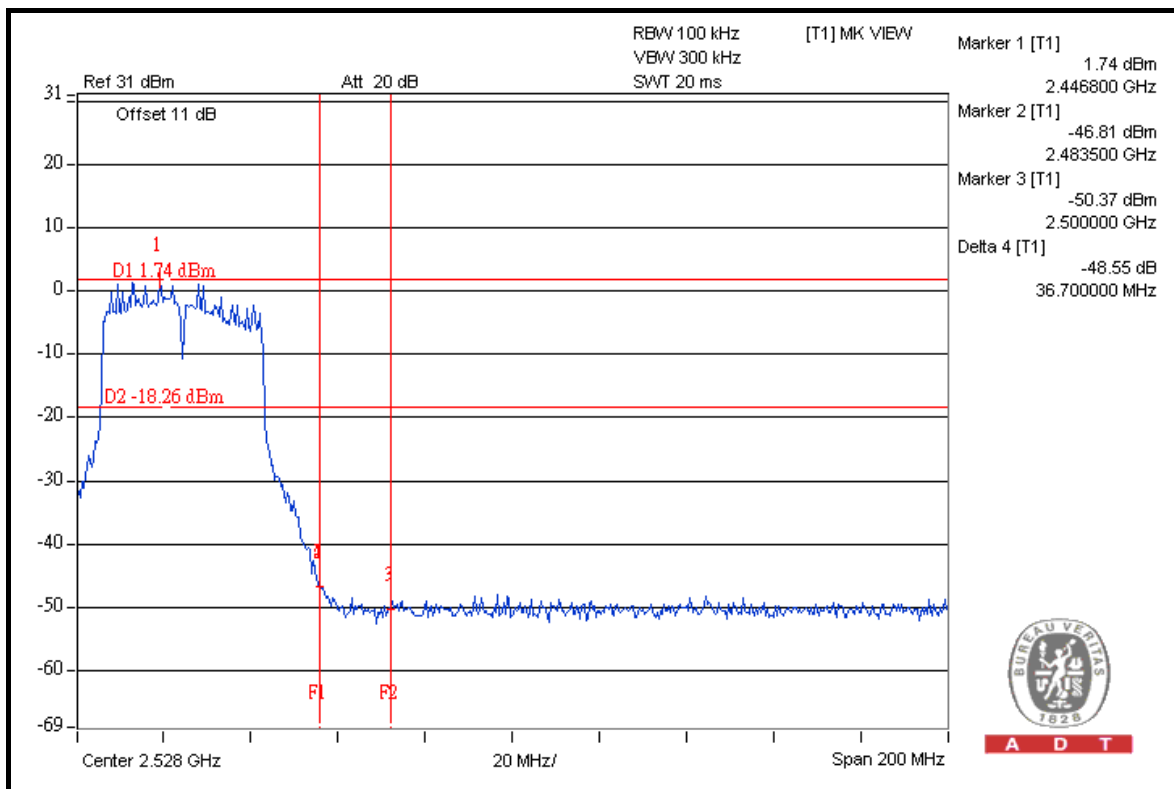
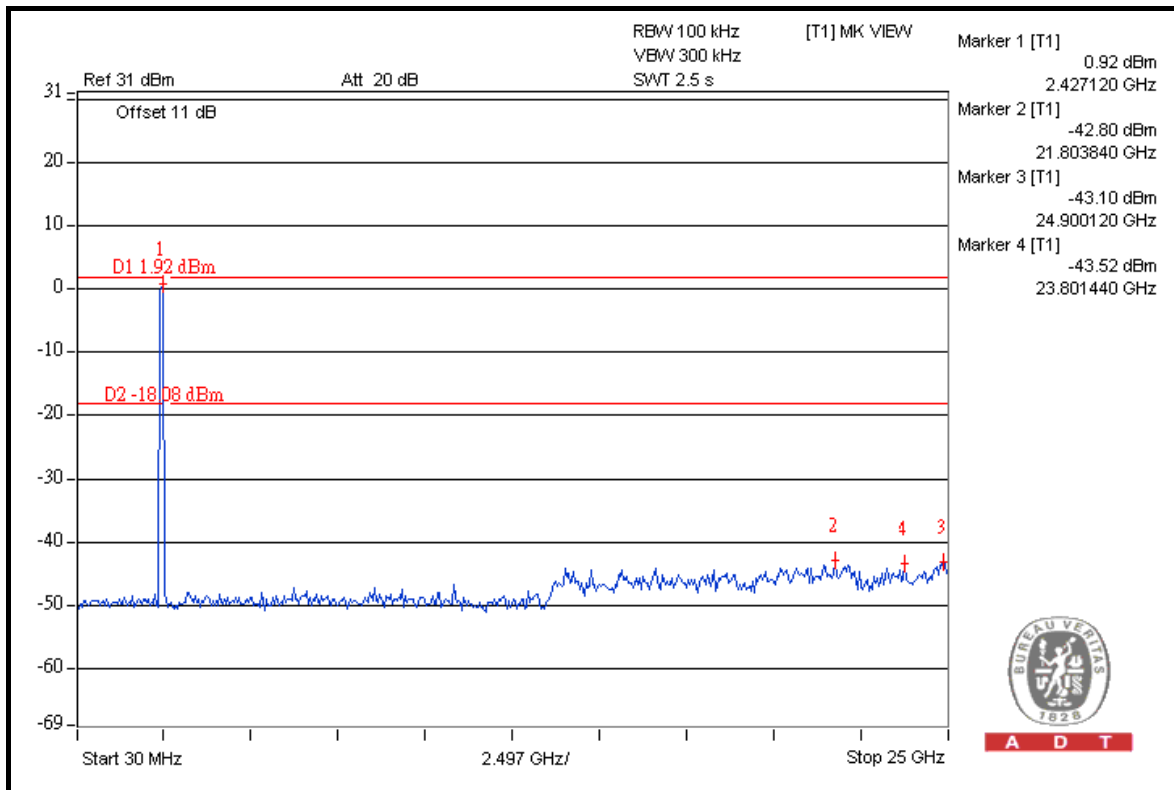
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FOR CONDUCTED MEASURED CHAIN 0



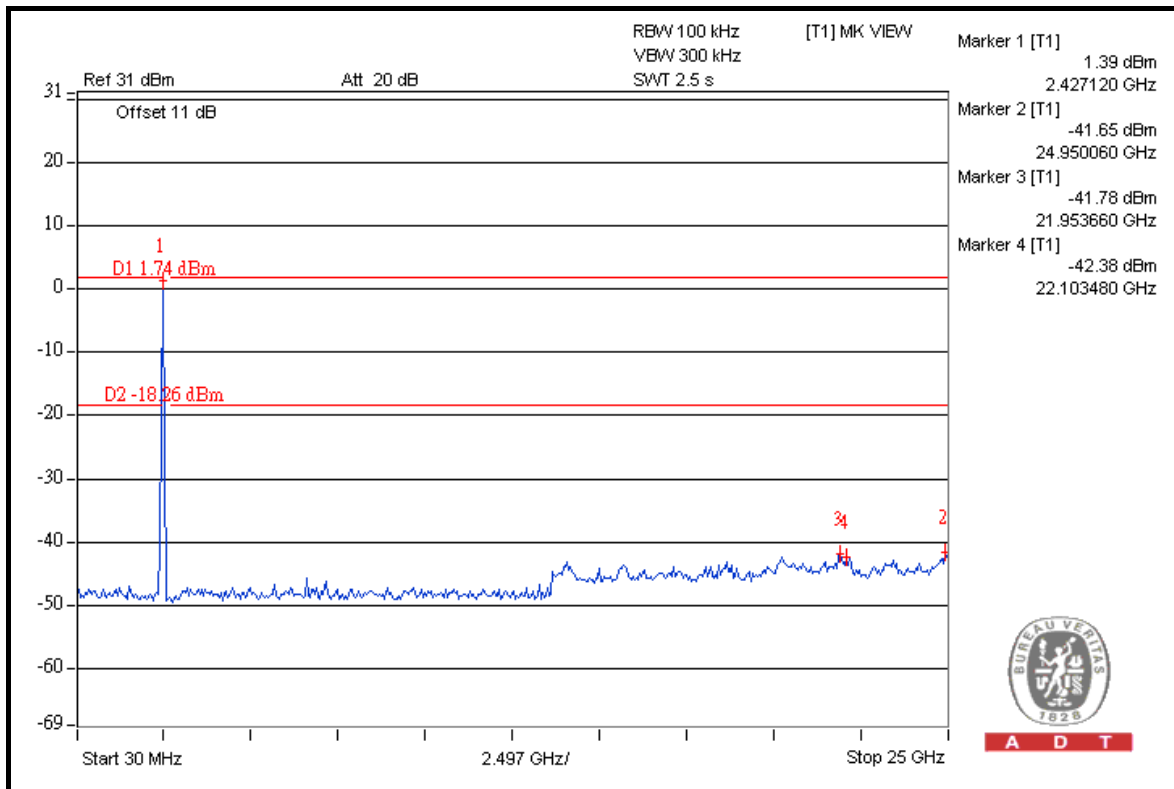
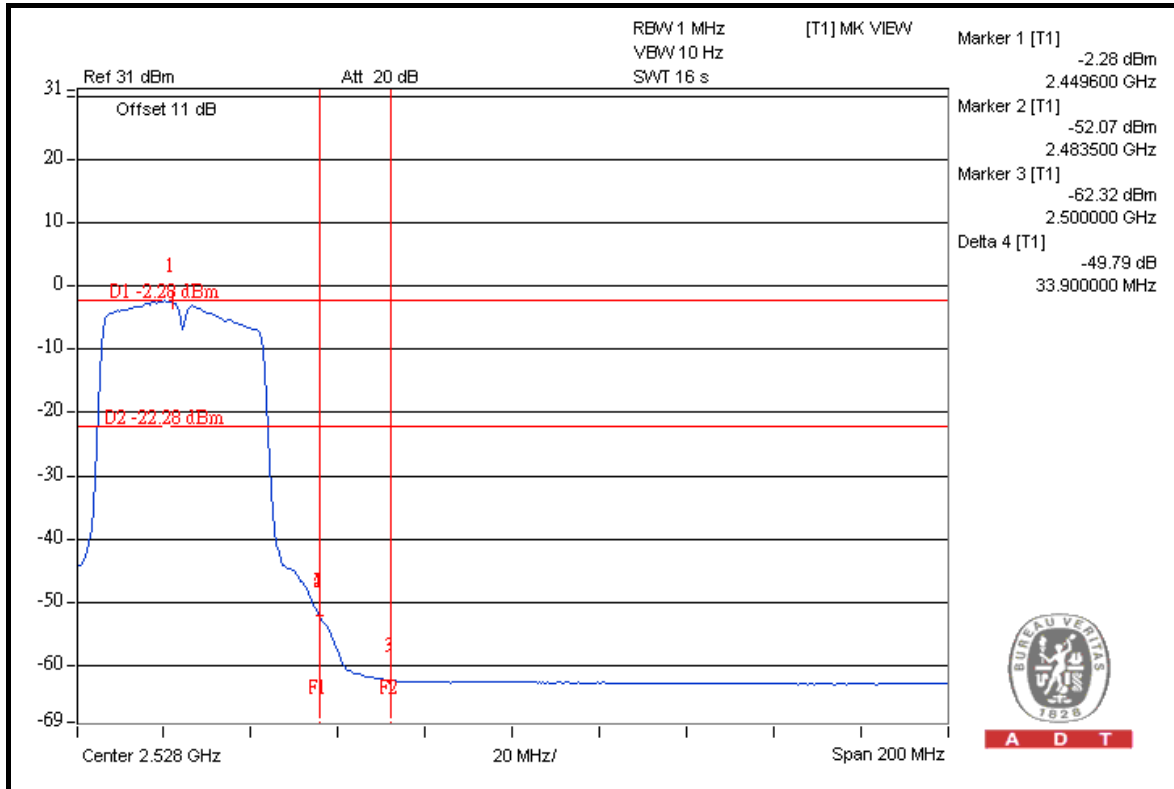


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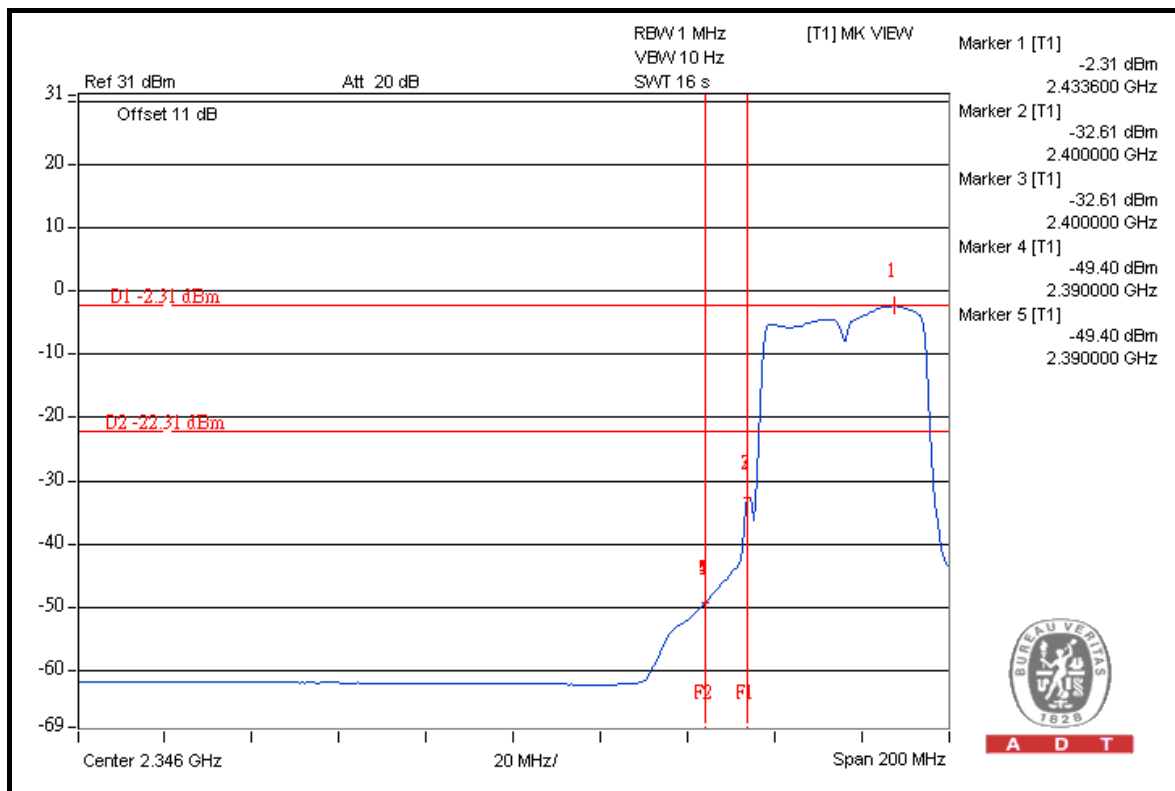
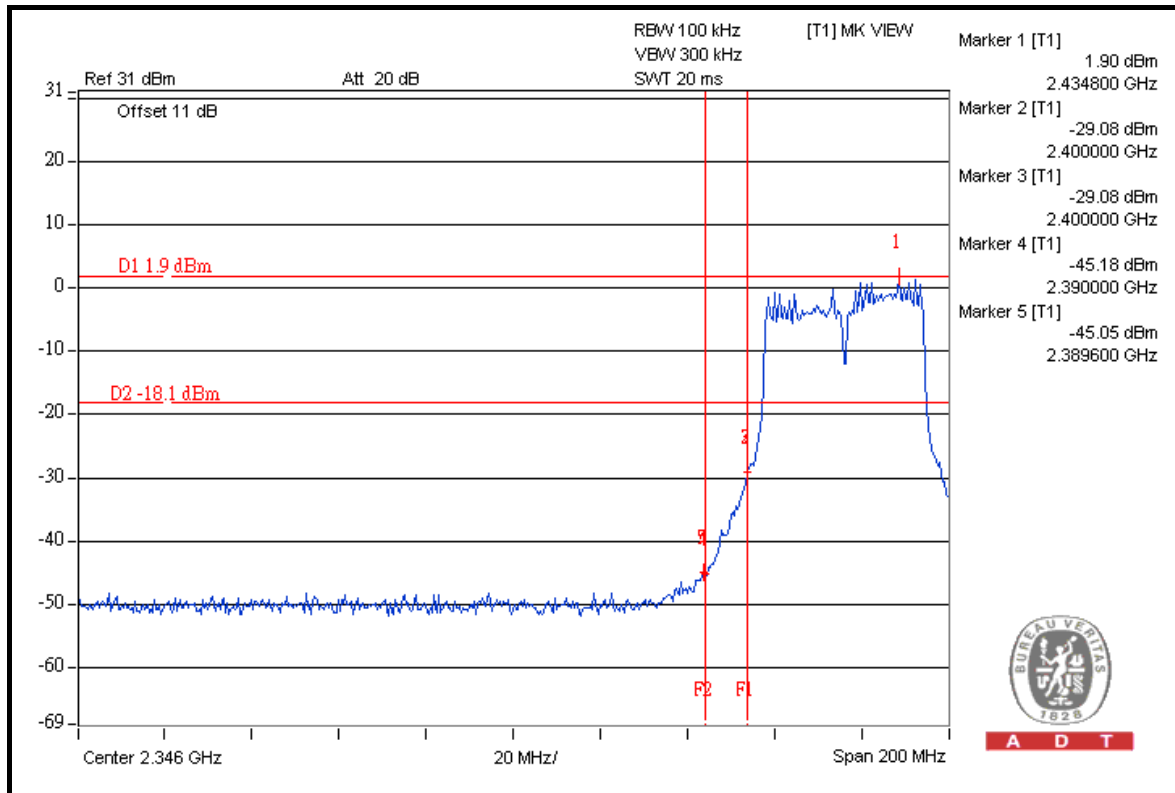
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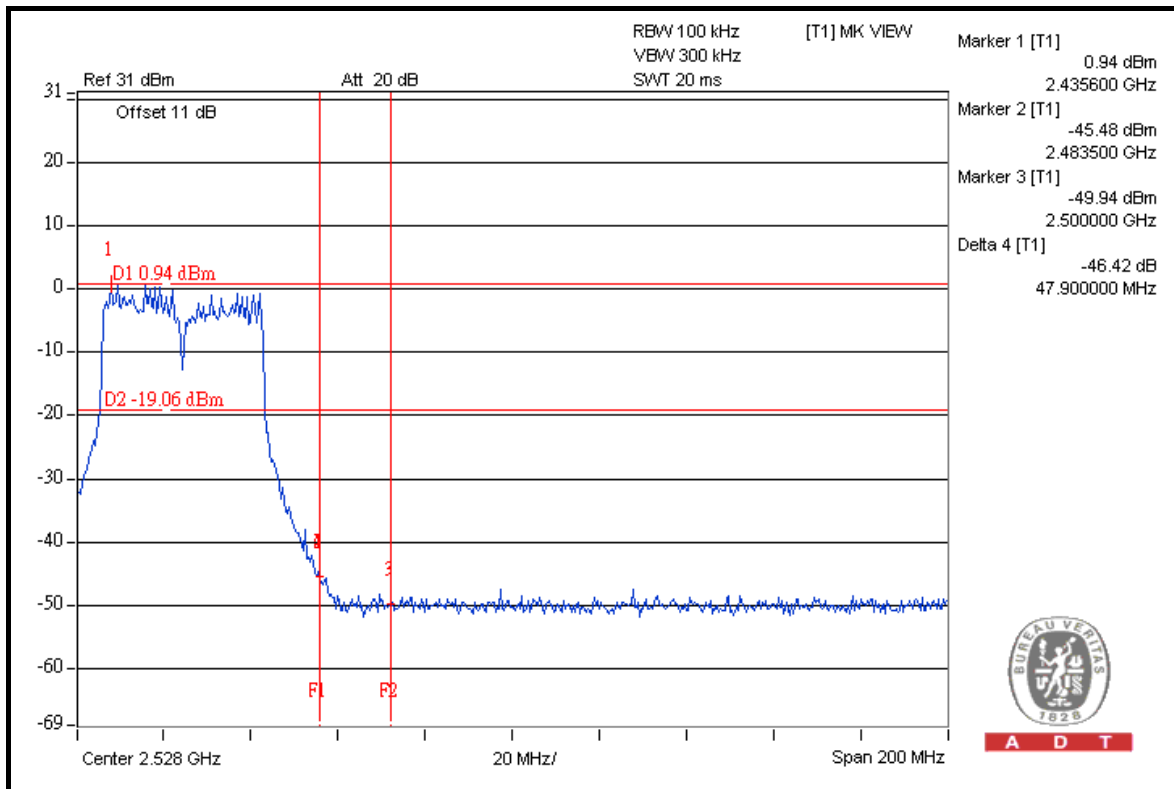
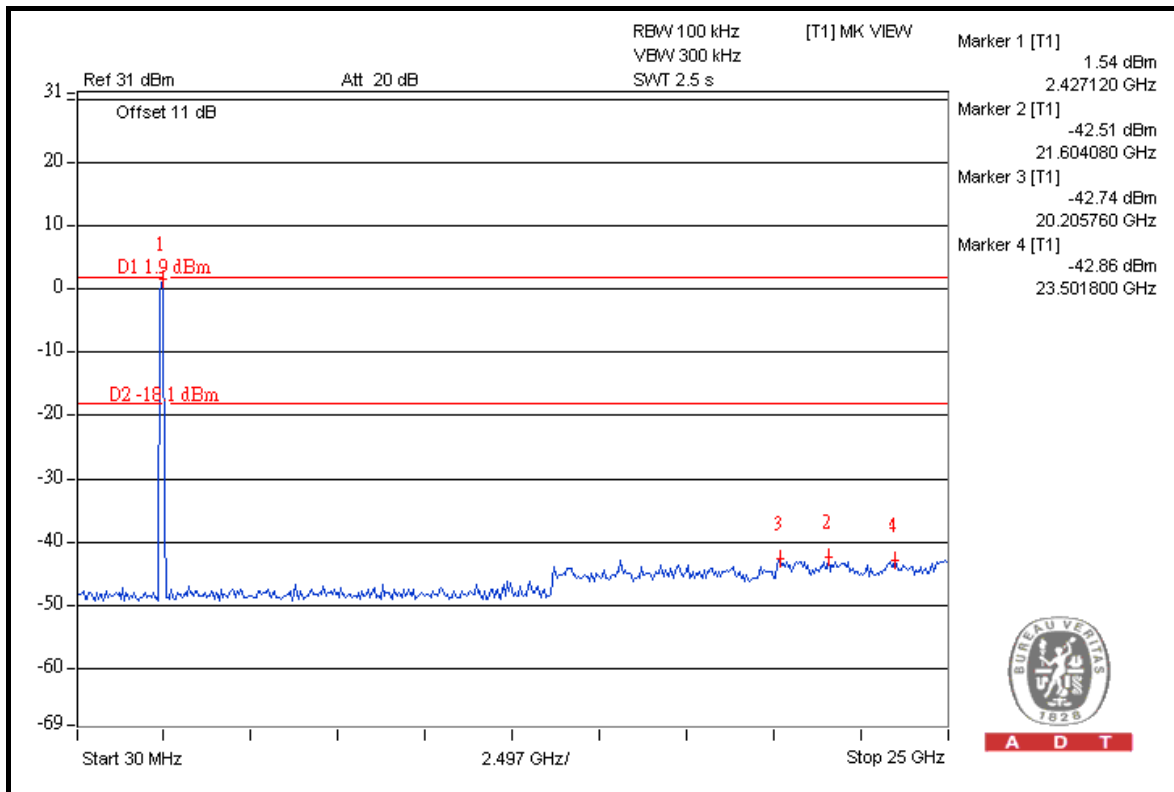
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CHAIN 1



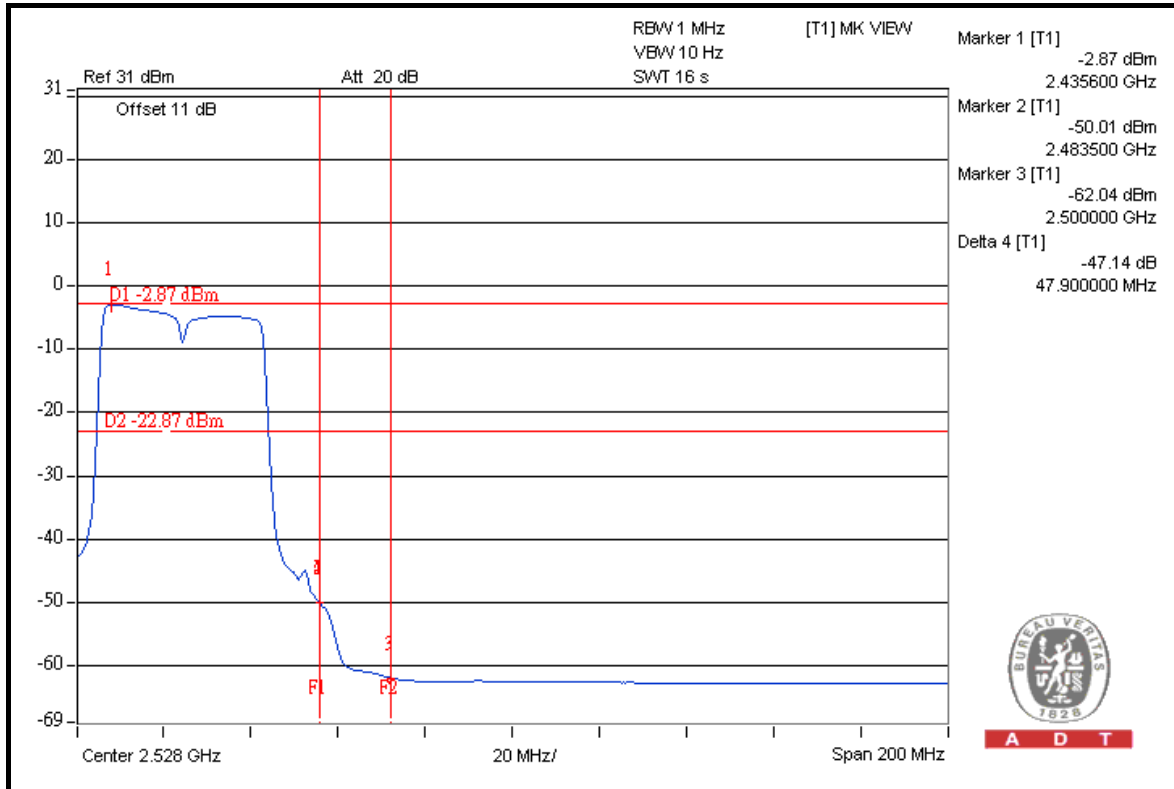


A D T

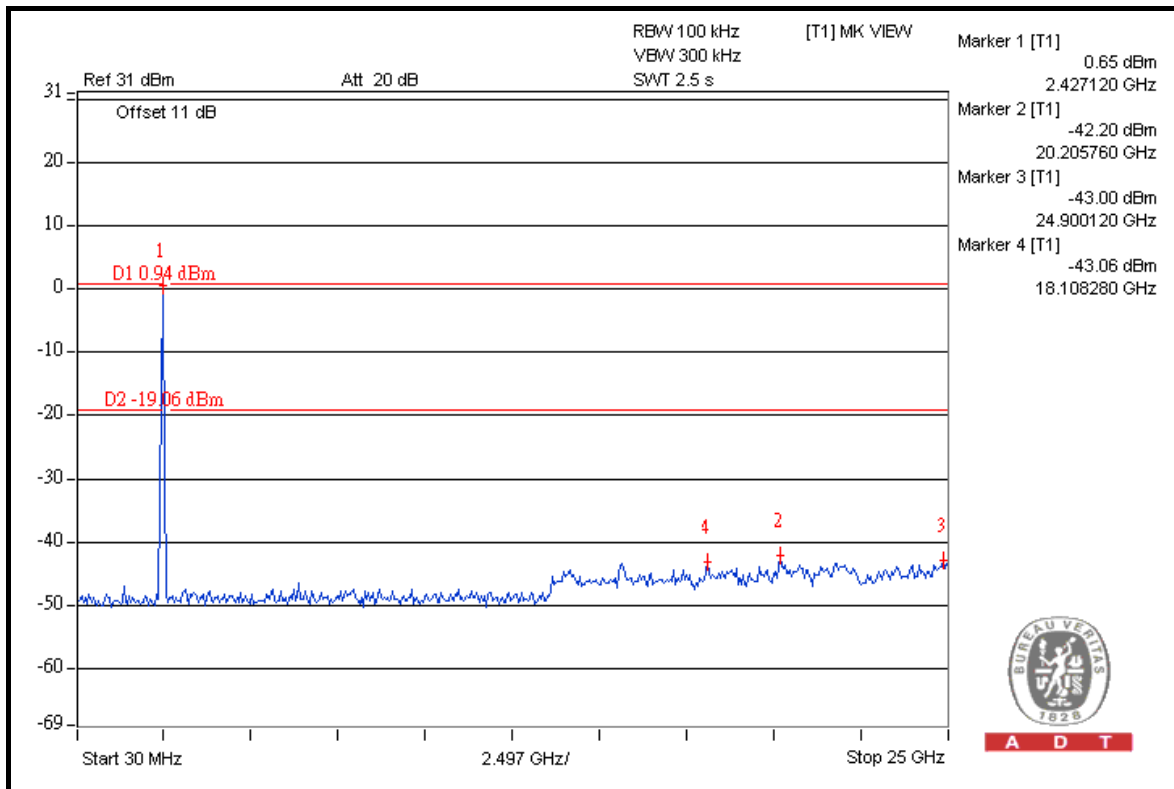




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5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



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6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation and authorization certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

www.adt.com.tw/index.5.phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Email: service.adt@tw.bureauveritas.com

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.



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7. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---